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## ORIGINAL COMMUNICATIONS.

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### THE RELATIONSHIP OF THE ANATOMY AND PHYSIOLOGY TO THE PATHOLOGY OF THE NOSE, THROAT AND EAR.

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The particular phase of the subject of this symposium with which the writer desires to deal, namely the close interdependence of the local pathology upon the peculiar anatomical and physiological variations of the organs affected, has always impressed him most strikingly and is a phase upon which he believes more emphasis should be placed in the teaching of the subject. Students in all branches are only too prone to accept statements dogmatically made without a proper understanding of the reasons thereof and as a result either never thoroughly understand their subject or soon forget it when learned. A proper understanding of the various factors that lead up to a final result always leaves a much more permanent impression than facts learned verbatim.

In no other portions of the body does it appear that slight variations of anatomical structure give rise to such marked deviations from the normal physiology and subsequently to pathological conditions. Nature has designed the upper respiratory tract with such minute attention to detail that a deviation of one portion is prone to encroach upon some structure of vital importance to the proper function of some other neighboring area.

One portion of the upper respiratory tract in which this is most important is the nose. Beginning externally, we first encounter the alae nasi. Occasionally there is undue flaccidity of the alae nasi,

due either to absence or insufficient rigidity of the lower lateral cartilages. This condition permits of the collapse of the alae against the septum during inspiration, effectually interfering with or completely obstructing nasal breathing. Naturally, this is followed by a whole train of symptoms characteristic of the mouth breathers. In infants it may be of more or less serious import, at times making suckling next to impossible and seriously impairing the nutrition of the child. The production of a partial vacuum on each inspiration in itself is likely to give rise to a series of pathological conditions in the nose and naso-pharynx. There is first produced a condition of chronic congestion with accompanying congestion of the sinuses, producing vacuum sinus headaches such as we frequently see following continued sniffing due to nasal obstruction. Again, there is the probability of a development of an hypertrophy of the Lusk's tonsil and the production of negative pressure in the middle ear with the accompanying chronic catarrhal otitis media.

These are a few of the sequences of this comparatively rare anomaly. Minor degrees of this condition are comparatively frequent but complete collapse is fortunately uncommon.

Passing further within the nose, we first encounter the septum. For a portion of the anatomy with apparently so little active function of its own, it merely acting as a partition between the two nostrils and supplying a scaffolding upon which can be spread mucosa to supply moisture and heat to the incoming air and contain the sensitive nerve endings for the olfactory bulb, it is capable of causing more disturbance of function of other structures and pathological conditions than one would at first imagine.

The septum, being composed of the quadrilateral cartilage, the perpendicular plate of the ethmoid and the vomer, all articulating closely and intended to act as one straight solid partition, is unfortunately, subject to deformities, due not alone to trauma. In fact, trauma plays but a comparatively minor role. The slightest deviation from the finely balanced normal rate of growth of each individual segment appears to be of far greater importance. Being a thin structure, placed at right angles to two firm unyielding plates, viz., the floor of the anterior fossa of the skull and the arch of the palate bone, it has no room to expand in the vertical direction either up or down, so that any disproportionate growth either of the whole or any component part of the septum, gives rise to some lateral bending, twisting or thickening which is especially marked along the upper edge of the vomer, running upward and backward from the anterior to the posterior edge of the bone. Even when the general direction

of the septum is straight a great majority of individuals will show some thickening along this ridge.

Another very common point of yielding of the septum and deviation is a gentle curve to one or the other side, high up and rather anteriorly. There is nothing intrinsically pathological about this condition, it being more of an anatomic than pathologic variation except in the more rare occasions where there are distinct exostoses or spurs. Even rather marked degrees of variation in certain individuals may be not only of no pathological significance but may be of actual value, such as deflected septum in individuals with atrophic rhinitis. In a marked, or even in a beginning case of atrophic rhinitis, under ordinary circumstances, one would not think of straightening a deflected septum, thereby increasing the already too wide nasal passages. We therefore see that deflections and variations from the normal septum are of significance only in so far as they encroach upon the physiological currents of air and normal drainage.

This point is again borne out by the fact that minor deviations of the septum high up opposite the middle turbinate produce more obstruction than marked ridges low down opposite the inferior turbinate because the normal inflow of air is upward and along the middle meatus to the choana.

The question naturally presents itself as to what pathological conditions arise as the result of deflections of the septum and the *modus operandi*.

When conditions are normal in the nasal chambers, the air enters the nose, rises to the middle meatus, carrying its fragrance bearing gases or particles, finding its way into and aerating the sinuses, receiving in turn its heat and moisture and leaving the nose by way of the choana for the pharynx, larynx and lungs, then returning by the same route although usually along the inferior meatus. The entire operation is noiseless and unaccompanied by any noticeable movement of the *alae nasi*. In the normal individual nature has so proportioned the structures that the lungs are capable of being properly filled at the normal rate per minute through the nose without effort on the part of the respiratory muscles, without noise and with the proper heating and moistening of the inspired air. Take this same normal individual and deliberately alter the physiological rate of flow of the inspired air by increasing the rate of respiration. This means that so many more cubic feet of air per minute must pass through the same size passage as previously. Immediately the respirations become noisy, the respiratory muscles are brought into more active play even to the point of bringing in the accessory mus-

cles of respiration, the mucosa becomes dry and parched and very soon the patient will complain of headache.

From the foregoing experiment we can readily see that adequacy of the respiratory passages is merely a comparative matter varying in different individuals and at different times of life. In the young and vigorous who take deep and full respirations, the passages must be larger and roomier than in those who lead sedentary lives. The latter require less oxygen for reparative purposes and consequently are much shallower breathers. It is for the same reason that individuals who pant and who complain of "being out of breath" almost invariably open their mouths to breathe so as to allow a larger volume of air to enter in a given time with less resistance and less effort on the part of the muscles of respiration.

With these physical and physiological facts in mind, it is easy to conceive of how deflections and deviations of the septum may be followed by pathological conditions in the nose. We all know how common it is to find encrustations in a nose that shows a marked obstruction, especially anteriorly. This is due to the rapid evaporation of the mucus on the surface of the mucosa owing to the increased velocity of air that passes over the obstruction in an effort to crowd a normal amount of air through an abnormally small space in a given time. This drying of the mucosa with crusting frequently gives rise to further obstructions to breathing and to frequent epistaxis. The crusts are often violently removed, either by the hand or by blowing, thereby tearing off some of the epithelium and causing superficial ulceration and hemorrhage. This again, occasionally, has still greater possibilities for damage in that it opens avenues for infection such as tuberculosis, especially in a tuberculous individual.

Mention has been made of the fact that long continued, rapid or violent breathing would produce headache. This the writer believes to be due to the production of a partial vacuum in the sinuses which is followed by an active congestion and pain. We all know the principle of the De Vilbis atomizer which does not drive the liquid up by direct pressure on the surface, but draws it up by negative pressure, produced by having a fair sized stream of air at a high velocity passing over a small opening which communicates with the tube leading into the liquid.

The nose is constructed along similar lines. There is a large rectangular tube for the passage of air having opening into it several small orifices leading to larger chambers or air reservoirs, viz., the infundibulum, and the opening of the maxillary, ethmoid and



sphenoid sinuses. During normal respiration only sufficient suction is exerted to allow a gentle changing of the contained air to prevent its absorption, etc.

During violent respiration or where the passages are constructed so as to increase the rate of the inflowing air, especially during sniffing, considerable suction is exerted resulting in a rarification of the sinus air and a congestion of the mucosa of the ducts and openings as well as of the sinuses themselves. This congestion of the mucosa at times inaugurates a vicious cycle in that the swelling of the mucosa attendant upon the congestion not only interferes with free aeration of the sinuses but also obstructs the outflow of contained mucus which mucus may increase materially in amount owing to the congestion itself.

All the elements necessary for the production of a purulent sinusitis are present excepting the infective micro-organisms. These, unfortunately, are not lacking in a large number of cases. The first coryzal infection finds good cultural medium with ideal cultural conditions present. The infected mucosa throws off serum, leucocytes, mucus, etc., which are retained owing to obstructed drainage, and there is produced an empyema of one of the sinuses.

From this brief description one can see some of the far-reaching effects of abnormalities of the septum; but this is not all.

The turbinates themselves are also affected by these deflections. In the beginning the swell bodies endeavor to compensate for the encroachment on the breathing space by contraction. Gradually, as the obstruction tends to increase, more work is thrown upon them until they "break" under the strain and fail to functionate normally but merely act as open blood spaces with but slight contractile powers. They puff up upon the slightest provocation and become the so-called turgid turbinates.

Indirectly the ears also are affected by deflections of the septum because of the extension of the low grade catarrhal inflammation from the nose and to the naso-pharynx and the Eustachian tube. This has a tendency eventually to cause chronic catarrhal otitis media. Marked cases of nasal obstruction with resultant mouth-breathing are followed by the low grade type of chronic laryngitis, due to insufficient warming and moistening of the inspired air.

Another condition occasionally encountered in the nose is that of intermittent attacks of sneezing and rhinorrhea. This frequently is due to too close approximation between the middle turbinate and the upper part of the septum. It is especially frequent in that type of case in which there are large middle turbinates containing anom-

alous air cells. These cells can hardly be called pathological but are merely anatomical abnormalities. They do, however, have a tendency to crowd up closely against the septum so that the slightest swelling of the mucosa causes the two surfaces to approximate and acts like a foreign body or feather tickling the Schneiderian membrane. There is a profuse flow of a thin watery secretion and reflex sneezing is excited. These large middle turbinates are particularly troublesome in those anaphylactic types of rhinitis such as hay fever, rose cold, bronchial asthma, etc. The fact that they play an important role in these conditions can be proven in that removal frequently eradicates the condition.

The above statements are substantiated to a considerable degree by the fact that we find comparatively little nasal pathology in the Negro race, in whom we find large, free passages and comparatively straight septa, that is, in the large majority of instances. A considerable proportion of the antral cases in this race are of dental origin.

Another fact of rather striking nature is the comparative infrequency of tumors of other than inflammatory origin such as polyps, etc., in the nose. Without more definite knowledge as to the true etiology of tumors a definite explanation of this fact cannot be forthcoming, but there may be some relation between the fact that it is a purely air conducting passage and not subject to the direct insult or injury by foreign materials as some other portions of the anatomy.

In the ear also variations in the normal physical conditions and physiological function result in pathological changes. The normal function of the tympanic membrane is dependent upon its flexibility which is retained only when atmospheric pressure in the external auditory canal and the tympanic cavity are equalized. This equalization of pressure is maintained only when the Eustachian tube is patulous and functioning properly. When, as the result of nasopharyngeal inflammation with extension into the Eustachian tube, mechanical obstruction of the Eustachian orifice or stricture of the tube itself, swallowing is not accompanied by the propulsion of air into the tympanic cavity, we have absorption of the air already present and marked retraction of the tympanic membrane with loss of motility. This is due to the excess of pressure from the outside keeping the membrane constantly forced in to the limit of its tensile strength. This maintained retraction of the tympanic membrane carrying with it the long handle of the malleus, results in forcing the foot plate of the stapes deeply into the oval window, giving rise to persistent roaring and tinnitus.

The constantly maintained vacuum in the tympanic cavity gives rise to a low grade reaction with thickening of the mucosa, sclerosis of the tympanic membrane and eventually ankylosis of the ossicles. The longer the condition continues the more marked will be the changes in the tympanic membrane and mucosa.

The Eustachian tube may be responsible for other conditions in the middle ear, notably acute infection. While normally intended to conduct air to the middle ear and insure necessary drainage from the middle ear, perversion of its physiological function may result in conducting fluids of various types, even purulent secretion, from the naso-pharynx to the ear.

During the act of sneezing or coughing as normally performed, the patient almost invariably keeps the mouth at least partially open to allow for the quick escape of the sudden blast of air due to the spasmodic contraction of the diaphragm. When, for any reason, the patient tries to hold the mouth closed in an effort to suppress the noise of the act, he will frequently force some of the excess air up into the middle ear, especially should there be some nasal obstruction as there usually is in conditions necessitating either sneezing or coughing. Often as the result of the irritant which excites the spasm or as a result of previous sinus disease, there is an accumulation of infected mucus or pus in the naso-pharynx. This may be forcibly projected into the middle ear by the *becchic* blast and give rise to secondary otitis media.

Another very common method of causing the same condition by a somewhat similar mechanism is the forcible blowing of water into the middle ear by swimmers. It is a common experience to see swimmers as they emerge from the water, immediately clasp their *alae nasi* between the thumb and first finger and blow forcibly in an effort to remove the water contained in the nose and throat. Instead of blowing it out as they would do should they leave the nose unobstructed by the hands, they frequently drive it directly up into the Eustachian tubes to the middle ear. Most swimmers realize their susceptibility to otitis media, but, not recognizing the *modus operandi*, put cotton into the external auditory meatus to prevent it. Were they to be instructed to allow the water to run freely from the nose and throat before making any effort to blow the nose, otitis media would be far less frequent among them.

In concluding this brief survey of the field of the relationship that exists between the anatomy, physiology and pathology of the nose, throat and ear, the writer realizes that he has by no means exhausted the subject but has merely touched upon the high spots.

His object has not been to present a large collection of facts that are self-evident to all but merely to encourage attention to every detail which will assist in maintaining or re-establishing the normal physiological function of the organs concerned and to view the anatomical variations from the standpoint of their physiological effects and pathological possibilities rather than from their cosmetic appearances. He feels that it is just as important for the oto-laryngologist to be mindful of the smaller details of his patient's perverted physiology and to instruct him how to correct them as to remove the existing pathology.

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### APPARATUS FOR IRRIGATING THE NASAL CAVITIES, USEFUL IN HOME TREATMENT.

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This is an apparatus that is being sold today and it has some merits, but there are also some dangers attendant upon its use. It consists of an ordinary douche bag, with a tube to which a nasal tip is attached. It is used on the principle of the gravity nasal douche, excepting that the outflow is directed through a tube fitted with a nose tip. This column of fluid is caught in a basin on the floor. The weight of this column of fluid produces a suction.

What are the dangers attendant on the using of this apparatus? If the patient has an acute condition and the turbinates are swollen and sufficient force is used, that is by having the height of the column of fluid too high, there is no reason why infected fluid will not enter the Eustachian tube and thence to the middle ear, possibly causing an otitis media.

The advantages are: (1) It is very useful in atrophic rhinitis. I have used this apparatus for over one year and it certainly is of great aid in cleaning up these foul-smelling cases; (2) in those cases, operated upon for sinus disease, but in which there is still present secretion. As a cleansing method and the patient properly instructed in its use, this apparatus will materially assist in the treatment of the conditions indicated.

Another advantage is that if the inflow is stopped for four or five seconds, the weight of the column of water or fluid that is going through in the outflow tube acts as a suction force and a Bier's hyperemia is produced.

## THE DIAGNOSIS OF ACCESSORY SINUS DISEASE CAUSING LOSS OF VISION.\*

DR. LEON E. WHITE, Boston, Mass.

The anatomy of the posterior sinuses and the relations of the optic nerves have been thoroughly investigated. The clinical histories of numerous cases have been reported and many theories advanced as to the etiology. The pathological findings, while not as complete as we would wish, seem to indicate three types of optic neuritis:

1. Those due to a direct spreading of the inflammation to the sheath of the optic nerve from the foci of infection.
2. Those due to the toxemia from infection in the sinuses.
3. Those due to hyperplasia.

It is not possible in all cases to determine definitely the type. Pus and polypi when present can usually be seen, but the hyperplastic type varies so little from the normal when the middle turbinate is not involved that macroscopically or even microscopically the diagnosis is most difficult. Hyperplasia has been defined by Vail as a rarefying osteitis associated with inflammatory swelling and fibrous thickening of the mucous membrane lining the accessory sinuses. It is brought about according to Delafield and Prudden by long continued hyperemia. That many obscure cases of loss of vision come from disease in the accessory sinuses and go on to optic atrophy, cases in which a correct diagnosis at the commencement of the neuritis might have saved the vision, is my excuse for again calling attention to this subject.

Many inquiries have been made as to what findings warranted the opening of the sinuses in optic neuritis. The ophthalmologist who sends a patient with sudden loss of vision, expects the rhinologist to either find or rule out disease in the sinuses. Where pus or polypi can be demonstrated or where there is marked blocking of the sinuses by a deflection of the septum or by hypertrophied turbinates, this is an easy matter, but only too frequently the nose appears normal. My second case was of such a nature. Everything was negative except the X-ray, which showed some anatomical abnormality in the sphenoids. Dr. William J. Daly, on referring the case, stated that optic atrophy would result unless the pressure on the nerve could be relieved at once, and it was at his most earnest solicitation and not on the nasal findings that I operated. The relief was so speedy and so evidently due to the operation that I became

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deeply interested and read practically everything to be found on the subject. Since then many cases have been seen. Some of these had gone on to optic atrophy, others were due to pituitary disease, but many were acute and the relief following the opening of the sinuses in such was most remarkable. In addition to the ophthalmological examination by the men who referred the cases practically all underwent medical, neurological, dental, Wassermann and X-ray examinations. The danger of delay in making a correct diagnosis is well illustrated by Case 4. On the first examination a week after the onset of his trouble the vision was 20-50 right and 20-20 left. This dropped within six weeks while he was under investigation and before his consent to an operation could be obtained, to 2-200 right and shadows left, and the nerve heads turned white. If his sphenoids could have been opened before the development of the atrophy his vision would probably have been saved, especially as marked pathology was found in the sinuses when he was operated on at the end of the six weeks. When toxemia is suspected, its origin, be it teeth, tonsils, accessory sinuses, intestinal auto-intoxication, alcohol, tobacco, lues, etc., should be first investigated, but time is so very precious that needless delay is criminal. This investigation should not consume more than forty-eight hours. The possibility of pituitary disease must also be considered. To illustrate the necessity of excluding this let me refer to a case which was sent to determine if anything further could be done for his progressive loss of vision. He had undergone a complete bilateral ethmoid and sphenoid exenteration. One glance at the enlargement of the pituitary gland as shown on the X-ray plate revealed the origin of the blindness.

That there may be marked hyperplasia of the accessory sinuses with nothing in the nose to suggest it, has been demonstrated in several of the following cases. To give you the findings in these cases before operation, the condition found on operation and the final results, has seemed the most logical way of presenting this subject.

In *Case 1* of chronic unilateral retro-bulbar neuritis, one year's duration, with vision for fingers, pus was seen about the sphenoid in sufficient quantity to warrant advising its opening. The advice was not followed and the eye became permanently blind and involvement of the ethmoids followed.

*Case 2* has already been mentioned. It was one of bilateral retro-bulbar neuritis of one week's duration, vision 10-100 with slight blurring of the edges of both discs. Nasal examination negative. X-ray showed a difference in the sphenoids. The middle turbinate

was removed and the sphenoid opened, no pus but hyperplastic tissue found. Complete recovery within two weeks.

*Case 3* was one of acute unilateral retro-bulbar neuritis of three day's duration with vision 20-40 following a severe attack of influenza. There was slight haziness of the margins of the disc and dilatation of the veins. The septum was moderately deflected and an enlarged and swollen middle turbinate completely blocked the superior meatus. Under local treatment the vision returned to normal but the nasal condition warranted the removal of the middle turbinate.

*Case 4* has been mentioned.

In *Case 5* of acute bilateral optic neuritis of two weeks' duration, the nasal examination was practically negative as were also the physical, neurological, Wassermann and X-ray. The right eye showed the disc pushed forward about two diopters with exudate on and about it. The retinal veins were enlarged and tortuous. The left disc showed marked neuritis but no swelling. Dr. Quackenboss, who saw the case in consultation, felt that unless there was immediate relief from the pressure, optic atrophy would result, so in spite of negative findings the right middle turbinate was removed and the right sphenoid opened. The tissue was somewhat thickened, seemingly hyperplastic. Improvement commenced within twenty-four hours, and although the right nerve head remained somewhat paler than the left, vision eventually returned to 20-20.

*Case 6*, unilateral retro-bulbar neuritis of five days' duration. Eye sensitive to pressure, marked blurring of edges of disc, light perception only. The septum was deflected to the left and the middle turbinate greatly swollen, evidently obstructing the sinuses. Nasal findings warranted the resection of the septum and removal of the middle turbinate. The sphenoid, owing to an infection, was not opened until some weeks later, so that the vision did not return quite to normal, 20-20 minus, and there was slight pallor of the nerve.

*Case 7* was one of bilateral optic neuritis of a week's duration with practically complete blindness in both eyes. The fundi showed marked neuritis, swelling of the disc and dilatation of the veins. Nasal examination was negative, as were also the Wassermann, neurological, X-ray and physical. In spite of the negative findings, both middle turbinates were removed and the sphenoids opened. This also was a case of hyperplasia. Sight commenced to improve within twenty-four hours and practically normal vision was eventually obtained, although there remained a slight pallor of both discs.

*Case 8* was also one of bilateral optic neuritis of six weeks' duration, with blurring of both discs and marked neuritis right.

Pituitary disease was suspected, which accounted for the delay in referring the case, but the neurological and X-ray examinations were negative. There was a slight deviation of the septum, otherwise the nose was negative. Having excluded practically everything but accessory sinus disease the right middle turbinate was removed and the right sphenoid opened. Although this case was of six weeks' duration, the vision returned rapidly, 20-20 left and 20-30 right in nine days. A diseased molar was later extracted and the antrum, which had been infected from the tooth, was cleaned out. Normal vision four months after operation.

*Case 9* was most unusual, as the patient entered the infirmary for exophthalmos of the left eye; it was pushed forward and outward, but the sight was not impaired. Foggiess came on two weeks later and the fundus showed a commencing choked disc, which grew rapidly worse so that within four or five days the vision dropped to 20-200. The physical, neurological, X-ray, Wassermann and nasal examinations were all negative. The seriousness of the case warranted the removal of the left turbinate and the opening of the sphenoid and posterior ethmoid. Vision commenced to improve almost immediately and was normal in one month. Then pain and blurriness developed in the other eye. The fundus showed a marked papillitis and the vision dropped to 20-200, so that side of the nose was operated upon. In eight days the vision was normal. Later, following a severe cold, there was some blurriness of the left disc, the first one affected, and the vision dropped to 20-30. Feeling that some infected cell had been overlooked in the first operation, all the posterior ethmoids were exenterated, the opening into the sphenoid enlarged and a permanent opening made into the antrum, which was found to be filled with pus. Vision became normal in a week. This case is unique, as the optic neuritis of the left eye developed while the patient was under treatment for the exophthalmos on that side. The neuritis in the right eye came on some weeks after that in the left had subsided. Then there was recurrence of the neuritis in the left eye.

This case seems to demonstrate that the optic nerve, while not in relation to the other accessory sinuses, may yet become involved from the toxemia of the infection, the antrum in this patient.

In *Case 10* there was neuro-retinitis and choroiditis of the right eye of three months' duration, with complete loss of vision. The X-ray, Wassermann, neurological, nasal and physical examinations were all negative. The operation was undertaken to determine what effect the removal of the middle turbinate and the opening of the accessory sinuses would have on the dilated veins of the fundus and

the severe pain about the eye. This pain was of such intensity as to require large doses of acetylsalicylic acid almost hourly. Vision unimproved but complete relief from the pain. Granulations and pus were found in the ethmoids.

*Case 11* was one of axial neuritis of eight months' duration. There was a large central scotoma for colors. Soft polypoid tissue was found in the region of the left posterior ethmoids bleeding freely at touch and most sensitive to pressure even after thorough cocaine-ization. Although the possibility of malignant disease was considered, it was not until the X-ray was seen that this suspicion was confirmed. The plate showed marked erosion in the sella turcica region. The clinoid processes were obliterated, ethmoid and sphenoid moderately obscured. No operation was attempted. The patient died some two weeks later. An autopsy showed that the sphenoid bone was almost completely pervaded by a round cell sarcoma. It had broken through the pharynx over a small area and extended into the greatly enlarged pituitary body. Although some of the polypoid tissue in the nose was removed the pathological report was negative. Dr. Verhoeff made sections of the optic nerves and tracts and found that the nerve showed no evidence of atrophy or degeneration, although there had been marked loss of vision (20-200) for eight months. Therefore, he said, could the pressure have been removed the vision would have probably returned. This leads us to hope to relieve cases of some months' standing, provided the nerve has not atrophied.

*Case 12*, unilateral neuritis of four months' duration, vision 20-70, marked swelling of disc, borders completely obliterated, retinal veins moderately full, tortuous and obscured at disc borders. There was a posterior deviation of the septum which crowded the left middle turbinate so as to obstruct the sphenoids and posterior ethmoids. The tissue in this region was distinctly boggy and mucopurulent secretion was seen about the middle turbinate. The X-ray plates showed left anterior and posterior ethmoids obscured and sphenoids rather hazy. These findings warranted the removal of the middle turbinate and the cleaning out of the ethmoids and sphenoid. The improvement was slow and the vision was not quite normal when last seen.

*Case 13* was one of bilateral optic neuritis of four months' duration accompanied by severe pain in the head dating back fifteen years, but much worse the past six months. Vision 20-200 and steadily failing. High myopia. Both discs were irregular in outline and white on temporal sides. Nasal examination showed

marked deflection of the septum and hypertrophied middle turbinates. Physical, dental, neurological, X-ray and Wassermann negative. The findings in the nose were sufficient to warrant the removal of both middle turbinates and the opening of both sphenoids. The right sphenoid was filled with thick gelatinous secretion. The left contained thick mucus and reddened areas. The progress of the neuritis was checked, the vision improved slightly and the pain relieved.

*Case 14*, a child of five years, had bilateral neuro-retinitis with total loss of vision for three weeks. The fundi showed stellate exudates and dilated veins. Neurological, X-ray, physical and Wassermann all negative. There was a slight deviation of the septum high up and both middle turbinates were swollen. While this finding was comparatively slight the fact that the case was treated a week without relief warranted the removal of the middle turbinates and the opening of the ethmoids. Light perception two days after the operation. In six weeks the child could count fingers at twenty feet, although there remained some pallor of the discs.

*Case 15* was one of bilateral papillitis of four weeks' duration. Vision for fingers 1 foot left and 20-40 right. Both discs were indistinct in outline, the left more so than the right. Physical, neurological and Wassermann examinations negative. The X-ray showed right antrum and posterior ethmoids obscured. The left middle turbinate was somewhat enlarged and secretion could be seen beneath it. The X-ray and nasal examinations gave sufficient grounds for the usual operation. Pus under some pressure was found in the sphenoid. The patient improved but the final report was not obtained as he shortly returned to his home in another state.

*Case 16* was one of unilateral retro-bulbar neuritis with some optic atrophy. There had been progressive loss of vision for two years. Within a year it had dropped from 20-50 to 20-200. The X-ray, Wassermann, neurological, dental and physical examinations were negative. There was marked deviation of the septum to the affected side and the middle turbinate was tightly wedged between it and the outer wall, sufficient grounds it seemed for the removal of the turbinate and the opening of the sinuses. The mucous membrane lining these cavities was considerably thickened, quite evidently a case of hyperplasia. Slight improvement followed the operation.

*Case 17*, acute bilateral neuritis of one weeks' duration, vision 20-30 right and 20-100 left. Marked papillitis of each disc and general edema of the retina. Both middle turbinates were hypertrophied, the left especially obstructing the sphenoid. This was re-



moved and the left sphenoid and posterior ethmoid opened; thickened tissue but no pus. Vision returned rapidly and was normal in five weeks.

The following cases have not been reported:

*Case 18*, Mr. A. W. M., 36 years of age, was referred by Dr. Quackenboss on May 24, 1919, with diagnosis of unilateral retrobulbar neuritis of four weeks' duration, vision 20-100, slight pallor on temporal side of disc. Dr. Quackenboss feared that the condition was one of primary optic atrophy as the vision had failed rapidly in the week he was under observation.

The patient had a severe cold with pain through the forehead a week before the onset of the haziness. The usual examinations were negative. The septum was deflected to the opposite side but the turbinate on the affected side was enlarged and especially obstructive. The position and size warranted its removal and the usual opening of the sinuses. Thickened tissue was found—probably a case of hyperplasia. Recovery was rapid. Two weeks after the operation vision was 20-30 and eventually became normal, although there remained slight pallor of the disc.

*Case 19*, Miss B. F., 60 years of age, was referred by Dr. C. F. Worthen on September 5, 1919, with diagnosis of acute unilateral optic neuritis of three weeks' duration, with vision fingers at 3 feet. The patient's other eye had been practically blind for some years. Fundus showed retinal veins engorged and disc moderately choked. It suggested Bright's disease, but the urine was negative as were the other usual examinations. There was, however, marked hypertrophy of the turbinate on the affected side evidently obstructing the accessory sinuses. The findings in the nose warranted the usual operative procedure. The turbinate was cystic and the linings of the cells were somewhat thickened but did not contain secretion. Eleven days after the operation the patient had a rather severe hemorrhage from the middle turbinate region and was greatly exsanguinated, but in spite of this the vision continued to improve. When she left the states some six weeks later it was 20-70 and the disc appeared about normal.

*Case 20*, Mr. G. G. P., 67 years of age, was also referred by Dr. Worthen on October 1, 1919, with diagnosis of chronic bilateral retro-bulbar neuritis of four months' duration. The vision, which was 20-100 right and 20-70 left, had been slowly failing. The right fundus showed marked congestion. The nerve was hyperemic and the blood vessels dilated. Tobacco was suspected and after its discontinuation the vision began to improve slowly, so that when he was examined no operation was advised. Cocain about the middle

turbinate and hot irrigations caused a much more rapid improvement in his vision.

When seen three weeks later it was nearly normal and the congestion of the fundus had almost entirely disappeared. The patient remarked that every time he irrigated his nose it improved his eyesight and lessened the foginess.

*Case 21*, Miss M. McG., 48 years of age, was referred by Dr. P. H. Thompson on November 13, 1919, with diagnosis of chronic bilateral retro-bulbar neuritis. The trouble was of nine months' duration in one eye, vision fingers at 4 feet, and in the other the vision, which had been failing for three months, was 20-70. History of severe pain extending through eye to the occiput and roaring in the ears. The medical and X-ray examinations were negative. Dr. Coriat, the neurologist, reported that the case was probably one of atypical multiple sclerosis. Both middle turbinates were enlarged and obstructing. A diagnosis of probable disease in the posterior accessory sinuses was made and it was felt by Dr. Thompson and myself that these sinuses were the chief factors in the loss of vision, especially as multiple sclerosis itself has been claimed by Shumway, Stark, Parsons, Aurbach and Brandt to be due to the absorption of toxins from the sinuses. The usual operation was accordingly performed on both sides. The pressure in the head and the roaring in the ears was entirely relieved. There was also a marked improvement in the visual and color fields. The case is still under observation.

*Case 22*, Mrs. H. B. M., 31 years of age, was referred by Dr. Derby at the infirmary on November 26, 1919, with diagnosis of acute unilateral retro-bulbar neuritis of seven weeks' duration. Following a severe cold the right eye became blurry and at the end of the week was totally blind. There was considerable pallor of the nerve. The usual examinations all negative. The middle turbinate on the affected side was enlarged and obstructive. Other probable causes having been eliminated the turbinate was removed and the posterior sinuses opened. In two days fingers could be made out close to the eye. The improvement, however, was only transitory. The pallor of the nerve increased and when discharged two weeks after the operation there was not even light perception. This case well illustrates how quickly the vitality of the nerve can be destroyed.

#### SUMMARY.

Of the twenty-two cases here reviewed three were not operated upon (Cases 1-11-20). In the first the eye remained permanently blind. In the second the patient died from a sarcoma; and in the

third the vision was improving when first seen and recovered under local treatment.

Of the nineteen operative cases all but two improved (Cases 10-22). In one the eye had been practically blind some months and in the other, of five weeks' duration, there was slight improvement at first, but the pressure had continued so long that optic atrophy resulted.

Normal vision was obtained in eight cases (2-3-5-8-9-17-18).

Marked improvement in four (Cases 6-12-14-19) but some optic atrophy.

Only slight improvement in five (Cases 4-13-15-16-21) this being due to the chronic nature of the disease and the delay in operating. In all these an early operation would probably have saved the vision.

In three there appeared to be a direct extension of the infection (Cases 11-14-15).

The toxemia from pus found in six cases seemed the chief factor (Cases 1-4-9-10-12-13).

Hyperplasia appeared the predominating lesion in thirteen (Cases 2-3-5-6-7-8-16-17-18-19-20-21-22).

In seven the nasal examination was negative (Cases 2-4-5-7-8-9-10).

In six the X-ray findings were positive (Cases 2-3-4-11-12-15). Negative findings, let me add, by no means contra-indicate an operation. So many medical men feel that a negative X-ray rules out accessory sinus disease that I wish to especially emphasize the point that it does *not* necessarily do so, as these cases well illustrate. This is especially so in hyperplasia, as only two of the thirteen cases showed any X-ray findings whatsoever.

The middle turbinate was removed in all the operated cases and the sphenoid opened in all but one (Case 3).

The posterior ethmoid cell is at present opened as a matter of routine. Unless suspected of infection the other accessory sinuses are not disturbed. The complete ethmoid exenteration does not in most cases seem necessary.

In this review it has not been possible to give much pathology. Many specimens from the hyperplastic cases have been sent to the laboratory but the findings have been practically nil. As Dr. Verhoeff, the pathologist, says, the specimens are more or less traumatized in removal and in decalcifying them whatever changes that may have occurred seem to be destroyed. In other words, the changes that take place in the sinuses are so slight and elusive that it is practically impossible to detect them. In examining the noses in the later cases turbinates that might by their position or size pre-

vent drainage have been especially noted. Whenever it has not been possible to pass a small cotton stick between the turbinate and the ethmoidal wall after cocainization, it was felt that they might be obstructive. The changes to be expected are only slight and I should not hesitate to operate upon a perfectly normal looking nose, if the symptoms were those of pressure on the nerve, after having reasonably excluded other possible causative factors.

Let me quote from Sluder's book Dr. Jonathan Wright's views on the pathology of hyperplasia:

"It would probably be difficult," he says, "to find an adult individual in temperate or cold climates who does not present an example of this bone change within his nasal chambers, which we have a right to call pathological. It is only exceptionally that the symptoms to which it gives rise are sufficient to cause him to seek relief. \* \* \* When in the walls of the sphenoidal or ethmoidal sinus there is involvement of the optic nerve in so far as it depends on bony pressure, blindness, partial or complete, is pretty sure to occur. When, however, the alarming symptoms of optic involvement are recent and slight, the trouble may not be due to a bony pressure, but to a pressure of soft parts, or to an extension of their inflammation or of their vascular congestion. These latter conditions may be relieved by giving free drainage and ventilation to an occluded sinus, but in an inaccessible region, if there is pressure of a bony surface upon an optic nerve, it is difficult to see how the symptoms are to be relieved. Fortunately, there is good reason to believe that in the nature of things, the encroachment of the field of engorgement and soft hyperplasia upon the nerve structures gives a timely warning so that surgical interference is *possible before an irreparable condition results.*"

It is a well-known fact that some cases of retrobulbar neuritis recover spontaneously. This is unfortunate in one sense as there is a tendency to wait so long, hoping to obtain this spontaneous recovery, that permanent injury results. In cases following an acute rhinitis where there is not complete loss of vision and where the pressure on the nerve is not so great as to endanger its vitality, one could wait a reasonable length of time before advising radical measures. The time, however, is so short where an operation can be of benefit that great judgment must be exercised in discriminating the types that might and might not recover spontaneously. I am hoping to obtain enough cases to draw some more definite conclusions on this line. Meanwhile it would seem the wiser course to err on the side of advising operations, possibly unnecessarily, than to permit one to become permanently blind through delay.

## A NEW INSTRUMENT AND METHOD FOR WASHING AND DRAINING THE NASAL SINUSES: PRELIM- INARY REPORT.

DR. MAX UNGER, New York City.

In order to make clear the mechanical and anatomical principles on which this new instrument is based, I shall first briefly review the anatomy of the os maxillare and the infundibulum.

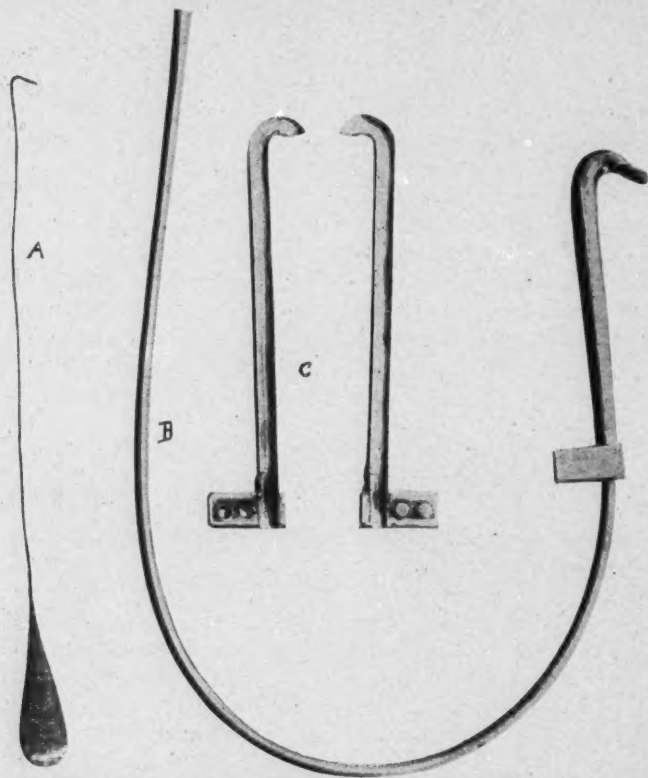
The infundibulum is a cavity situated in the middle meatus of the nose. It is a funnel-like depression, flattened from side to side, its channel practically vertical and the wide end above. The outer side from below backward is formed by the bulla ethmoidalis, the infundibulus groove of the ethmoid, and the uncinat process of the ethmoid. The inner side, from before backward, is formed by the lachrymal process of the inferior turbinate, the body of the inferior turbinate, and the ethmoidal process of the inferior turbinate. The upper boundaries of the infundibulum form a narrow slit-like opening leading to the middle meatus, known as the "hiatus semilunaris"; the lower, a round opening known as the "os maxillare," leading into the antrum. The hiatus semilunaris is about three-fourths of an inch long by one-eighth to one-fourth of an inch wide. The infundibulum is about one-eighth of an inch in diameter. The following diagram illustrates the shape and relation of the parts.

The infundibulum may therefore be properly called the antro-nasal canal. The upper (front) end of the hiatus semilunaris frequently is connected with a groove leading to the fronto-nasal canal. The antro-nasal canal (or infundibulum) being practically vertical, it can readily be seen that in order to put an instrument into the nose and then into the antrum it will be necessary to reverse the direction of the instrument when it is brought opposite the hiatus semilunaris. This is what is accomplished by the new instrument to be described. Plate 4 illustrates the relation of the antro-nasal canal to the antrum and nasal cavity.

As illustrated on Plate 1, the instrument consists of a tube, split lengthwise and bent into a semicircle at one end. When the two halves are together and the lumen of the tube is complete, a rubber catheter pushed in through the lower end will be deflected by the curve at the upper end and will emerge bent at an acute angle, as shown in Fig. C, Plate 1.



The method employed is as follows: A rubber catheter is inserted into the instrument (which may be called an antrum intubator) until its tip shows at the beak of the tube. With the beak up, the intubator is then introduced into the nose until the opening is opposite the hiatus semilunaris. This position is illustrated in Plate 2. The intubator is then turned sideways for  $45^{\circ}$  until the opening



A. Probe to locate hiatus semilunaris. B. Antrum intubator closed, containing catheter. C. Halves of antrum intubator taken apart.

looks down into the hiatus semilunaris, the end of the beak touching the outer nasal wall. The intubator being held firmly in position with one hand, the rubber catheter is pushed through with the other for a distance of 2 inches. The tip of the catheter, as it comes out through the upper end of the intubator, will be deflected downward by the outer wall of the infundibulum and enter the antrum. This



Second position of antrum intubator, showing catheter introduced into antro-nasal canal.



Head of cadaver, with tubes in both antra, through ostea maxillaria.

position is illustrated in Plate 3. After the catheter has been pushed in far enough, the two halves of the intubator are separated and removed, leaving the catheter in situ. The antrum can now be



Case 3. Front view, showing tube in antrum, introduced through natural opening.

washed through the latter, or the tube may be cut off inside the nose and the inner part left for continuous drainage and ventilation of the antrum, to be removed and replaced as often as indicated. The washing fluid comes out alongside the tube. The drainage takes

place by capillarity and by the suction exerted by the respiratory movement of the air on the end of the tube that projects from the antrum.

The indication for the use of this method is any condition that requires washing and drainage of the antrum. Washing by this method is much simpler than by puncturing the antrum wall in the inferior meatus, because it can often be done without cocaine and even without adrenalin. The drainage is constant and adequate, and therefore the kind needed in purulent inflammation of the antrum. The belief that one or several washings will cure a sinusitis is not supported by experience in treatment of abscesses elsewhere. An empyema of the pleura or an otitis media must be constantly drained—so must a purulent maxillary sinusitis.

This method of entering the antrum can be used in about 50 per cent of the cases. In the other cases, a high position of the "hiatus semilunaris" or a hypertrophied middle turbinate prevent its employment. Work is now being done to develop a method of dealing with these conditions.

One case may be cited to illustrate the usefulness of this method. L. F., a female, aged 22, single, suffered for many years with a profuse purulent rhinorrhea. About a year ago her right middle turbinate was removed, and six months later a Caldwell-Luc operation was done on the right antrum. The openings were maintained with difficulty for about two months, when they closed. About that time the ethmoid cells were cleared out. The discharge continued unabated.

Washing and drainage of the antrum was begun by the method just described. Her right frontal sinus was treated the same way with a drainage tube through its natural opening, and the discharge from her nose has almost ceased.

**MASTOIDECTOMY (PERISINOUS ABSCESS, EXPOSURE  
OF DURA) FOLLOWED BY ATTACKS OF TOXIC  
INSANITY. RECOVERY.\***

DR. OTTO GLOGAU, New York.

Whether or not an affection of the ear is directly or indirectly the cause of insanity has not as yet been decided. W. Sohler Bryant, after examining a number of insane, concludes, that aural disease in some cases has an effect upon the form of psychosis by giving rise to certain hallucinations of hearing. In a smaller number of cases ear disease appears to be an inciting cause of insanity, because of its influence on psychic functions as well as a systemic infection. When the organ of hearing has been operated upon, especially when such vital brain tissues as the sigmoid sinus and the dura had to be exposed, with the factors of anesthesia, shock and systemic absorption playing an important role, the possibility of otogenous disturbance of mental equilibrium looms even larger. Emile Amberg, in his excellent essay on Ear Affections and Mental Disturbances, states, that in the toxemic, exhaustive and irritating conditions accompanying or following an inflammatory infection within the ear, the patient must, under certain circumstances, be considered, for the time being, as mentally inferior. J. A. Hagemann, in his treatise on "A Rhinologic Aspect of Some Mental Disturbances," points out that some toxins or substances whose essence we are not yet familiar with, exert a malificent influence upon the association centers in the brain, and the human economy, apparently, does not produce any contesting anti-toxins. W. A. Janes, in an article on Insanity from Autotoxic Poisoning, draws attention to the organs of transformation and arrest of normal and abnormal production (liver, gastro-intestinal mucous membrane, spleen, lymphatic nodes, adrenals and thyroid gland) and to the organs of elimination (kidneys, lungs, skin and intestines) as possible otologic factors. A. M. L. Hamilton considers intestinal auto-intoxication as the cause of insanity and believes that the more sudden and active the manifestations of delusions or hallucinations are expressed, the more positive are the indications of auto-intoxication. Acute and infectious diseases are, according to J. B. Ayes, frequently followed by insanity. He mentions amongst others, cases of insanity in the course of pneumonia and "catarrhal colds." Couk-

\*Read before the Section on Otology, N. Y. Acad. of Medicine, January 9, 1920.



pepper, in his work written prior to 1654, says: It is probable that some certain poison in the body may be the chief cause of madness. According to Charles K. Shillo and others, the mental disorders at pregnancy and puerperal state, are probably in a considerable portion of cases toxemic, without reference primarily to childbirth. *Assuming that insanity in these cases is of toxic origin, why do only a comparatively small number of cases, after childbirth, infectious disease, anesthesia, surgical interference, etc., show mental aberrations, ranging from mild psychosis to pronounced insanity?* Because the majority of people do have more or less normal mentality and even these toxic influences cannot easily upset their mental equilibrium. Conservative neurologists would try to explain the insanity of toxic origin, by molecular or otherwise determinable changes within the brain matter. The psychanalyst denies the importance of an underlying anatomic substratum for psychic processes. He explains our actions by the struggle of suppressed wishes and fears and considers overwhelming complexes at the root of our personality. *Only in specially susceptible subjects with labile mental equilibrium will these toxic influences derange the normal psychic mechanism.* A psychanalytic study of these cases will be of great interest and value.

The case presented tonight suggests the assumption that the toxic factor alone is not responsible for the attacks of insanity following mastoidectomy, although the focus of infection is so near the brain, especially with pus surrounding the sinus and dura. It is rather a combination of somatic and psychic causes. *The repressed wishes and fears, based on actual facts in the patient's life, immediately preceding the operation, due to the toxic influence, are aroused and thrust over the threshold of unconsciousness and become manifest in these attacks of insanity.*

*Case Report.* Mr. H. T., 29 years of age, was referred to me on October 24, 1919, by Dr. M. Fishberg, who saw him only once, after he came to New York, from Dupon, Pa.

*Past History.* Patient has always been well before and never suffered ear trouble. About three months before his visit to the office he experienced severe pains in his right ear, which kept him awake at night. He also had fever. The doctor who treated him did not advise paracentesis. Several days later the ear opened spontaneously and discharged for a little while. The pain, however, grew worse and extended towards the neck and head. He became very dizzy and weak. About four weeks ago he came to New York. Paracentesis was performed in a hospital and he was told to return

home. The ear kept on discharging very freely. The last few days his pain grew worse; he became very dizzy and weak. Because of a severe cough and suspected lung trouble he was brought to Dr. Fishberg, who, recognizing the ear as the underlying condition, and sent the patient to me.

Physical examination showed a rather well nourished male in a state of marked prostration. He could scarcely walk; looked very pale and sick; complained of excruciating pains in the right ear and of dizziness. The right drum membrane was discharging freely. The upper posterior canal wall was sagging. There was redness over the right mastoid region and severe tenderness to pressure over the entire mastoid bone, especially far backward in the region of the sinus. The local symptoms, together with the apparent brain complications, made an immediate opening of the mastoid and an exploration of the adjoining brain structure imperative. The patient, however, postponed the operation for over a day and his condition became worse. An X-ray picture of both mastoids showed a destruction of cells on the diseased side.

On October 25, 1919, at 5 p. m., I performed the operation at Beth David Hospital, Dr. Call and Dr. Bernstein assisting. The mastoid cavity proved to be totally destroyed and filled out with pus and granulation tissue. The destruction reached up to the dura, which was exposed and found apparently normal. Backward and downward there was an extensive perisinous abscess which reached from the sigmoid sinus downward to the region of the bulb, from where pus was constantly oozing alongside the sheath of the blood vessel. The sinus was exposed to the extent of  $1\frac{1}{2}$  inches and was found to be pulsating, its wall of apparent normal color. Thrombosis was therefore not suspected. After removing all the diseased tissues, including the entire tip, and after enlarging and curetting the necrotic antrum, the mastoid cavity represented the size of a large wall nut. Due to the exposure of dura and sinus the cavity was not closed but lightly packed. The regular dressing was applied. The patient soon came out of the anesthesia and felt quite well. The dressing was changed every second day, the wound looked nice, the patient being comfortable. For the following description of the course of the disease I am indebted to the house doctor, Dr. Lewinson. On the fifth day, towards evening, the patient appeared somewhat stuporous, his pupils were widely dilated. The same night he became very talkative and would not permit anybody, including doctors and nurses, to approach his bed. He claimed he saw a fly at the other end of the room which was the angel of

death. He asked that the window should be opened as his wife and children were waiting outside in an aeroplane. He accused everyone in the room of being a conspirator and his enemy. He became very violent and jumped out of the bed. By great force only could he be given a hypodermic injection, and he shouted that this was the sting of the angel of death (the fly). Even after repeated hypodermic injections, he had to be tied down to the bed, and then slept until morning. He woke up with manifestations of great violence and he would knock at the window calling people for help.

Dr. H. Climenko, called into consultation, made the following observations: Patient is orientated as to time and place, complains of pain. Without being asked, he tells an incoherent story of a fire in his place of business for which he was accused of arson. He motions with the hand constantly, driving away the angel of death. He sees flies in the air, and claims that someone persecutes him without reason. He has auditory hallucinations. He hears a train wreck in which his wife and children perish. His speech is incoherent.

*Physical Examination.* Knee and ankle jerk lively. Babinsky absent. Left plantar surface irritated, ankle clonus absent. Some spasticity in left lower extremity, not enough to be called Kernig. Abdominal reflexes present. Both protopathic and epicritic sensibility present in lower extremity. Wrist and elbow reflexes present. No astereognosis. Some clumsiness of right upper extremity; diadochokinesis. Slight ataxia in right upper extremity. Facial innervation weaker on right side. Marked assymetry of face, especially lower two-thirds. Divergence of right eye and slight von Graefe. Nystagmus absent. Pupils react promptly to light. Disk clear-cut, no break in blood vessels, no tension. Mobility of lower extremities normal. No past pointing in upper extremities. Slight tremor of right hand. Romberg not absolute, slight swaying. Gait staggering, head bent to right side.

Dr. Climenko expressed the opinion that we might have to deal with a tempero-sphenoidal abscess and advised the exploration of this part of the brain in case the attacks of insanity should continue, especially when the optic disc should show changes.

From now on, for six days, the patient acted in the same manner. During the day he would be quiet, reasonable and well orientated. He recognized everyone and apologized to doctors and nurses for his bad behavior on the previous night. He took food willingly but showed no interest in his surroundings. With the approach of

dawn he would begin to express great fear. He would even distrust members of his own family. He talked incessantly until foam appeared on his lips. He expressed religious fear. He said God punished him for his past deeds, he asked God to forgive him for going out with indecent girls and for having secret relations with his sister-in-law. He was constantly reciting prayers in Hebrew, at times he would refuse food, claiming it is fasting day. He tried to convince God that he did not commit arson when his place of business burned down. He also tried to bribe God by offering charity. He was extremely restless and threw off the dressing. His people urged that something should be done and almost insisted upon an exploratory operation on the brain. I refused to do so, claiming that we were dealing, not with a brain abscess, but with toxic insanity, which in due time will disappear.

At this time, the second neurologist, Dr. Isidor Abrahamson, was called into consultation, who saw him at daytime, during his time of quietness and orientation. He gave me the following report:

Left hemiparesis, mainly face, less arm and hand, least in leg. Tendon reflexes livelier on left side. Superficial and corneal reflexes normal. Left abdominals diminished as compared to lively right. Right plantar reflex always flexor type, left frequently extensor, but no Babinsky; same of Chaddock. Mendel Bechterew present left. Left adeodochokinesis. Left upper extremity ataxia, overpointing. Tremor both hands, especially left. Pupils, ocular movements, normal. Fundi; slight venous congestion. Visual fields normal. No sensory disturbances, no astereognosis, no disturbance of deep sensibility. Physically: patient completely orientated as to time, place and person; memory good, speech normal, attention O. K. No evidences, at time of examination, of hallucinations or delusions as determined by the actions of the patient. Patient tells freely of his hallucinations and ascribes his delusions to dreamy states of consciousness.

*Summary of Findings.* (1) Signs along left half of body; (2) dreamy states characterized by visual hallucinations; (3) mastoiditis, involvement of the brain substance, etc.; (4) clear intervals.

*Conclusion.* (1) Spinal fluid examination for cells, etc., necessary; (2) strong suspicion of tempero-sphenoidal abscess; (3) further observation necessary for (a) spread of signs and symptoms, (b) formation of laudable pus at the side of involvement, (c) exploratory operation then. After this report, when during the next two days the attacks of insanity continued, the people urged me to perform the operation upon the brain. However, I refused to

do so. Spinal puncture showed fluid under moderate pressure, negative for Wassermann. Cytology was normal and no bacteria present. The fluid was clear and one + for globulin.

Gradually the patient became more and more sensible at night and would talk less, falling asleep when exhausted. During the day he would even read the newspaper intelligently. He soon had perfectly quiet nights. He now recollected in terms of fear all his delirious acts, explained he heard threatening voices, saw faces and people (dead and living) calling him and God, who appeared to him asking him to lead a more religious life and do more charity.

On November 20 he was discharged from the hospital. The mastoid wound was dressed a few more times and was totally healed on December 8.

On December 10 I sent the patient back to Dr. Abrahamson, in order to have a neurological report of his present condition. It is as follows: Subjectively—slightly blurred vision occasionally, especially at home, perhaps some dizziness, no tinnitus, no diplopia. Poor sleep. Awakens after a few hours of sleep and finds it then hard to fall asleep again. Bowels as always somewhat constipated. *Psychically, patient is subjectively and objectively normal.*

*Physical Examination.* Right pupil larger than left, both react normally. Insufficient convergence O. D. The right eye is more prominent. Upward rotation of right eye more than left. Right aperture larger than left. Weakness of left lower two-thirds of left facial innervation, seen especially when laughing. Jaw jerks lively, jaw to left and downward, chin to right, head flexed on left shoulder. Grips, right stronger than left. Tendon reflexes lively all over but equal. Abdominal reflexes lively, equal; plantar reflexes normal equal. Fundi oculi normal. No corneal anesthesia. No Romberg, no ataxia, no tremors, no past pointing, etc. Power in lower extremities equally normal. Nystagmus very easily induced on rotation, especially when rotating to right; nystagmus to left.

#### SUMMARY.

Very little left that is pathological as far as the central nervous system is concerned. The deviations from the normal in the right eye may have pre-existed the mastoid and cerebral involvement. No evidence now of mental disease. I would regard the entire picture presented by the patient at my first examination as composed by two components: (1) a local edema of the right temporo-sphenoidal lobes, (2) general toxic manifestations in the course of septic disease. With the recession of the focal edema most of the focal



signs vanished. With the recession of the infection, the infectious toxic signs vanished.

The following were the laboratory findings during the stay of the patient in the hospital; cerebrospinal fluid, reported above.

*Urine* was examined daily; during the period of actual delirium it showed albumen and few hyaline casts.

*Blood.* White blood count first 12,000, gradually decreased to 9,000. Differential count was at first 82 polys and gradually decreased to 75. Blood Wassermann negative.

The temperature varied from 99° to 101° F. The variations were very irregular and apparently not coinciding with the variations in mental equilibrium. Pulse varied from 76 to 95, only once being 100; respirations 22 to 26.

An inquiry into the patient's life elucidated the fact of the fire which destroyed his place of business, for which he collected insurance and for which he was falsely accused of arson. There seems to be also quite some foundation for the sins he tried to bribe God for, during his attacks of insanity.

The following conclusion may be drawn from the report of the above case: Attacks of insanity following mastoidectomy, especially with exposure of sinus or dura, are of toxic origin. The hallucinations and delusions point also to a psychic cause or rather susceptibility, which is founded on certain suppressed wishes and fears that occupied the patient's unconscious state previous to the operation. The otologist should therefore also have some understanding of the psychanalytic side of the problem.

Previous to any operation, especially on structures near the brain, an investigation of the patient's psychic status should be made. In case such post-operative attacks of insanity occur, mind rather than matter will then be regarded at fault. Disregard for the psychic aspect of the problem may incorrectly lead to the assumption of a tempero-sphenoidal abscess being the cause of these attacks of insanity and may lead to unnecessary exploration of the brain.

64 E. 91st St.

## MASTOIDITIS WITHOUT TYMPANIC INVOLVEMENT.

DR. SAMUEL SALINGER, Chicago.

From time to time cases are reported of "primary mastoiditis," so-called because of the absence of any concurrent or recent suppurative otitis media. While it is possible to have a hematogenous infection within the mastoid cells proper in which the tympanic cavity takes no part, yet it is not an easy matter to entirely eliminate the latter as the primary focus. Even in the absence of a history of recent discharge from the ear or signs pointing to a healed otitis media, it frequently happens that such an infection actually did exist in the attic and antrum some time previously, of such mild degree as to have been forgotten. It is important, on this account, that before a case be accepted as a true primary mastoiditis, the history be thoroughly searched for a possible preceding otitis media. Inasmuch as the mastoid process, particularly the antrum, so frequently partakes of the infection of the middle ear, it is not unlikely that a nidus may remain dormant for years until awakened into activity by some slight exciting cause as a rhino-pharyngitis.

A case bearing on this point occurred in the person of a lad of eight who was brought to the office with a red, painful swelling behind and above the ear, which the parents stated had developed in the past forty-eight hours. This had been preceded by recurrent pains in the ear for about two weeks, growing worse up to the time of the appearance of the swelling. There had at no time been any discharge from the ear. The examination disclosed, in addition to the brawny peri-auricular swelling, a drooping of the postero-superior walls of the bony meatus. The inferior and anterior portions of the drum alone being visible, appeared to be rather dull, white and opaque. The hearing was somewhat impaired. Temperature 102° F., pulse 120. A closer interrogation disclosed the fact that the boy had had a discharge from both ears in early childhood which had lasted several weeks and had ceased spontaneously.

The child was anesthetized and the drum membrane incised, but no pus was obtained. The mastoid was then exposed and opened. The cortex was very dense and hard. A few cells were encountered which contained granulation tissue. The antrum was opened and found to be filled with granulations and pus, evidence of a

chronic degeneration of its muco-periosteal lining. The aditus, which was rather narrow, was then enlarged and the middle ear, on being probed, yielded nothing. The child made an uneventful recovery.

This case clearly demonstrates that an apparently spontaneously healed mastoid mastoiditis may flare up into dangerous activity after a long period of quiescence and that it is as truly secondary to an otitis media as though it had manifested itself at the time the ear was discharging.

25 East Washington Street.

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### CAVERNOUS SINUS THROMBOSIS FOLLOWING A SECONDARY MASTOIDECTOMY.

DR. JOHN A. ROBINSON, New York City.

On September 28, M. G., age 52, a Russian, was admitted to the New York Eye and Ear Infirmary, on the service of Dr. E. B. Dench, with an acute mastoiditis involving the right ear, a streptococcus infection of two weeks' duration. A simple mastoidectomy was performed. Neither sinus nor dura was exposed. The patient was discharged on October 15 with the cavity granulating well and a dry canal. He returned to the dispensary at irregular intervals for dressings. About the middle of November he developed an acute purulent otitis, following an acute rhinitis, with a return of the purulent discharge from the tympanum and an increased discharge from the posterior wound.

On November 19 he complained of pain in the ear and mastoid area and frontal headache, with moderate temperature and increased aural discharge. Five days later he was readmitted to the infirmary. Examination on that day showed a moderately tender mastoid. Temperature 100°, pulse 72, respiration 18. There was a moderate amount of discharge from a small post-aural opening and from the canal.

November 25 the headache became worse, the temperature ranged from 99° to 101°, there was increased mastoid tenderness and conjunctival injection of both eyes appeared. The right fundus could

not be seen, as the lens was slightly opaque. The left fundus was normal. There was slight immobility of right eye.

A blood count was made by Dr. S. Dixon, who reported as follows: Red cells, 5,000,000; leucocytes, 20,000; polymorphonuclears, 80 per cent; large mononuclears, 6 per cent; small mononuclears, 13 per cent; transitionals, 6 per cent.

A blood cultivation made at the time was reported seventy-two hours later to be negative.

On November 26 a secondary mastoidectomy was performed. The cavity contained a moderate amount of rather soft granulations. A small area of sinus and dura in the middle fossa was exposed. The sinus was slightly pale at one point, otherwise of good color. On the following day, November 27, the temperature rose to  $104^{\circ}$ , pulse 106, respirations 26.

After a restless night he complained of frontal headache, pain at the back of the neck and in both eyes, with an increased injection of the conjunctivae of both eyes. Lumbar puncture showed a turbid fluid under pressure; globulin +, and a cell count of 1,360. No vertigo. No nystagmus. The caloric reaction showed an active labyrinth.

On November 28 his condition was poorer; temperature  $103^{\circ}$  to  $104^{\circ}$ . Chemosis affecting both eyes appeared, more marked on the right side. A beginning exophthalmos of the right eye was apparent; the lids became edematous; pupils moderately dilated; Babinski and Kernig present. The patient was rational and complained bitterly of headache. There was a profuse discharge from the canal and cavity.

November 29, temperature  $103^{\circ}$  to  $104^{\circ}$ . The chemosis, exophthalmos, ocular pain, and photophobia increased. A second lumbar puncture evacuated a turbid fluid with no increase in pressure, and a reduction in the cell count to 370. A cultivation from the fluid showed a streptococcus longus.

November 30. The temperature continued high, with no remissions. The patient was irrational at times and restless. The appearance of the eyes remained about the same. It was decided that in view of the dual involvement of a purulent meningitis and probable cavernous sinus thrombosis any operative procedure was deemed inadvisable. From this time the condition grew progressively worse, the patient lapsing into coma and dying on December 1. No post mortem examination was permitted.

## A SIMPLE, BLOODLESS TONSILLECTOMY, WITH A SIMPLE, SAFE, LOCAL ANESTHESIA.

DR. SOL ROSENBLATT, Chicago.

This will describe a tonsillectomy that is practically bloodless, that requires only two simple instruments besides the tongue-depressor, that is complete and painless, and that, without aiming at speed, will have the patient out of the operating room within five to fifteen minutes from the time he entered it.

So much has been written on this subject, demonstrating the proverb "Paper is patient," and there are so many favorite methods, and so often has the "last word" in tonsillectomy been pronounced, that I must appear either bold or foolhardy to present this paper. But if I describe a method of tonsillectomy that will accomplish all that is set forth in the opening paragraph, I feel that it may suggest some slight improvement on methods that I have at times observed, and indeed in the past, myself have practiced. I have gone the pace through finger dissection, blunt dissection and sharp dissection, and still I am not hardened enough to be able to enjoy seeing a patient writhe on the chair for half to three-quarters of an hour, gurgling and spraying blood. I am sure this is not the picture of any patient of any reader of this article, but you all have seen it. And that is the excuse for this paper.

### THE LOCAL ANESTHETIC.

The solution used is common enough—1 per cent novocain, with about ten drops of 1:1000 adrenalin added to 15 cc. of a fresh solution. The important point is to inject it deeply enough. I have long ago abandoned the time-honored metal tonsil-syringe with the short dental needles. There are two possible points of leakage in the extension tube on the syringe, and it is impossible to see how much, if any, of the solution is being injected. I use a 5 or 10 cc. Luer glass syringe, with a fine gauge slip-on needle at least  $1\frac{1}{2}$  inches long. All air can be expelled from the syringe and there are no leaks, and best of all, you can see how much is being given and where.

The needle is plunged boldly about an inch deep outward, upward and backward, just one stab immediately above the point where the two pillars meet, thus reaching just external to the highest point of the superior pole or supra-tonsillar fossa. The second stab is about 5 mm. external to the middle of the edge of the anterior pillar, so directed slightly outward as to bring the point of the



needle either within the layers of the capsule or slightly external to same. These two stabs are repeated on the other side for the other tonsil, making four stabs in all for both tonsils, and injecting at most about 2.5 cc. at each stab, or 5 cc. on each side, and 10. cc. in all. I am indebted to Dr. Jos. F. Hawkins of Providence, R. I., for pointing out the advantage of the second stab above mentioned in not only anesthetizing the tonsil, but also in serving to lift the tonsil from its bed, making it more prominent and thus more approachable—this being especially true in "submerged" tonsils. The four stabs should be done in prompt succession, and proceeding leisurely, should not take over two minutes. *The very moment the last stab is made* the operation can be *immediately* commenced on the tonsil first stabbed.

There need be no wait of any time at all between the injection and the operation. With the long needle the anesthetic is placed exactly where it is needed in the first place, and there is nothing to wait for. With the popular dental needles, which are very short, it has been found necessary to wait approximately a quarter of an hour for the solution to penetrate to the point where it is needed, and the routine often is to make three injections into the anterior pillar, three into the posterior pillar and one or two into the tonsil itself for good luck, or a total of eight stabs on each side. I submit that two stabs, as described, are far more effective, and immediate in action. This is not mere theory—I have been using this method for a long time, although I cannot fix the exact date, and I invariably ask the patient, and get the same reply, "no pain" or "practically no pain."

As to *gagging*. There need be no gagging, even in a person with a sensitive throat, and even if there should be any gagging, it will not interfere in the least with the operation hereinafter described, nor cause any delay. The patient is instructed to breathe through the mouth during the operation, panting like a dog, and reminded of this at the first sign of gagging, and the gagging is practically nil. Time was when I painted the pharynx and base of the tongue with pure cocain flakes, and at times with a 10 or 20 per cent cocain solution, to prevent reflex gagging, but this is wholly unnecessary. In making the necessary application for such purpose, unless a spray be used which is not controllable as to place of application or quantity, parts are purposely touched which cause the patient to gag, and which wear or scare him out before the operation is begun. By using no cocain in the throat there is a saving of time, of valuable cocain, and of the patient. A newspaper article recently reported the death of an eighteen-year-old patient

while being sprayed with a 4 per cent solution of cocain, as preliminary to a tonsillectomy. There being no details given, one can only surmise—there may have been an idiosyncrasy—or a stronger solution or adrenalin might have contracted the blood vessels enough to prevent too rapid absorption, but why use it at all in an operation that does not require that the pharynx be touched, aside from the tonsillar area which can be anesthetized by the two stabs above described.

As to *age*. I prefer to use general anesthesia for young children, but have no hard and fast rule. Have used local in children from eight years old up, where they appeared tractable, and where on account of heart condition it resolved itself into a question of which would be more exciting and wearing, the general anesthesia and after sickness, or the local anesthetic—this being decided according to the view taken of the child's temperament. The local method is suitable to almost all adults, but even here, as with children, temperament should be considered, for no matter how painless and rapid the operation may be, the wear and tear of a mental shock of operation is a factor that should not be ignored, and it is better to give a general anesthetic, even to an adult, than to waste time with a highly nervous person who rebels at a local.

One point about a slip-on needle—it sometimes slips off. After the injection is made the glass syringe may come out leaving the needle sticking in place. It is an embarrassing moment, and either the fingers or a forceps are used to extract it. This is an avoidable accident. A piece of sterile lined thread may be tied around the needle, and then fastened to the glass syringe, or the same thing can be accomplished by a permanent wire arrangement, so that if the needle should pull loose from the glass syringe, it is nevertheless withdrawn with the syringe.

Have never found it necessary or desirable to use morphin prior to the operation. Where convenient, as a routine, I like patients to take syrup of Ferri iodid for week or ten days prior to operation, giving as the adult dose 3 grm. in water tid. p. c. This routine has been adopted after trying out calcium lactate and other preparations on a large number of cases. The syrup of Ferri Iodid was noticeably much more effective.

#### THE TONSILLECTOMY.

Only three instruments are necessary—a tongue depressor, a tenaculum, and a Beck snare. This is a simple instrumentation. Oh, yes; I know the reader will at once think of his favorite snare, or his Sluder or even his guillotin, and ask why he should change, just as I did before I accepted the Beck instrument; or, if he al-

ready has a Beck, and the number is rapidly increasing, he might say he didn't know it was feasible for a local operation. I was fortunate enough to be able to observe the technique of Dr. Jos. C. Beck, in the use of this instrument with general anesthesia, and to have his supervision at my first trials. That technique I have used so far as applicable in connection with local anesthesia, and when once acquired, it is immaterial whether the patient is lying down asleep or sitting up awake.

The technique can be easily learned by anyone who knows a tonsil when he sees one, and can be satisfactorily described on paper, as I shall attempt. The patient having been anesthetized as above described, the operator is seated very close to him at the side, *tete à tete*, or astride him, if the operator so prefers, and for the removal of the right tonsil, the Beck snare is held gently in the right hand. The left hand holds the tongue depressor and depresses the tongue at the side of the tonsil to be removed. By keeping the tongue depressor to the side the possibility of the patient gagging is minimized. The patient is here again reminded to breathe or pant through the mouth so as to prevent gagging. The tongue is depressed only a few seconds, just long enough to slip the loop or fenestrated part of the snare under the inferior pole or lobe of the tonsil and raise it up in its bed. The snare loop at this time is almost horizontal, but with a very slight tilt anteriorly and externally, the part of the ring nearest the posterior pillar being the highest. The moment the inferior pole is thus engaged, the tongue depressor is removed and discarded. The left hand of the operator then hooks the thumb under and around the shank of the snare loop to afford a leverage against the pressure of the index finger of the same hand, with which the operator massages the tonsil through the loop, the massaging being done against the anterior pillar. As soon as this pressure between the thumb and index finger has been started, the instrument is tilted more towards the front and slightly externally, so that the loop has been moved from the horizontal to the vertical. The right hand adjusts the position of the instrument to co-ordinate with the leverage and massaging of the left hand, but the right does not exert any pressure, being so far away from the pressure point that the leverage principle is against it, and would require too much effort to be effective. As soon as the index finger of the left hand feels the hard ring of the loop without any interruption, palpating through the anterior pillar, the trigger of the instrument is sprung forward by one of the fingers of the right hand, which holds the snare—this releases the screw attachment of the snare, and allows the wire loop to be pulled up snug.

Not until this wire loop is pulled up tight should the index finger of the left hand be released, nor should the relationship of the snare to the index finger or to the tonsil be altered by moving, as any slight motion or release of the index finger of the left hand may allow tonsillar tissue to escape the ring. But as soon as the wire is tightened and the trigger pulled back to engage the screw, which also prevents the wire from loosening, the left hand can be removed, and if necessary the patient can be allowed to expectorate, or move—he is caught by that wire more securely than a fish on a hook, and the operation is all over except to grasp the tonsil with the tenaculum to prevent it being inhaled or swallowed, and then to tourniquet the tonsil off by turning the screw end of the snare handle. The left tonsil is removed in the same manner with the left hand holding the snare and the right hand the tongue depressor—the right index finger being used to massage the left tonsil through the loop.

After the tonsil is tight in the wire loop, if the operation includes the entire tonsil, a dimple will usually be seen in the anterior pillar due to an eversion of the tonsil over its capsule. In massaging through the anterior pillar the place where tonsillar tissue is most likely to escape the loop is at the extreme tip of the loop and upward, so that if the complete ring is not felt at this point, it indicates that part of the upper pole has not been included. Should the operator be unsuccessful in including this piece of upper pole, the operation is defective, but may nevertheless be carried to conclusion, and the small piece of upper pole which will be found remaining can be grasped afterwards by the tenaculum and snared off with the ordinary snare without any dissection. Even with such a mishap, the operation remains practically bloodless, with less after-bleeding, quicker, and with less strain consequent on the patient, than any other operation I am acquainted with.

To prevent injuring the anterior pillar when the tonsil is being massaged through the loop by the index finger, both index fingers have the nail trimmed as close as possible, and then are further protected by a finger-cot. In hospital practice it is easy to keep on hand a large supply of finger cots which have been cut off from discarded rubber gloves, sterilizing a jarful at a time.

It is important to keep the ball of the index finger pressed through the snare loop (pressing through the anterior pillar) until the wire has been pulled snug, and the wire in tightening squeezes the ball of the finger (covered by the anterior pillar) out of the loop, following the natural cleavage between the tonsil and the pillar. The

position of the index finger is such, that if the operator had been using an unyielding instrument like a guillotin or a Sluder, the blade of the instrument would have buttonholed the anterior pillar and cut off the skin at the tip of the index finger, neither of which of course could happen with a wire loop. At the edge of this invagination made by the index finger, the rubber of the fingertip frequently is caught in the loop just at the margin of the anterior pillar and a small piece of the rubber is left in the loop when the finger is removed; this would spoil a good glove, and so I prefer finger-cots, which are thrown away after one use.

#### ADENOIDS.

Too often it is assumed, without investigation, that the adult or adolescent patient, seated before the operator, has no adenoids—this conclusion being more pleasing to the operator, who does not wish to assume any more labor and care in connection with an operation under a local anesthetic than is expected of him—and all the patient expects is the removal of tonsils, and the removal of adenoids does not increase the fee, notwithstanding the high cost of meat. It is not my purpose here to discuss the part played by adenoids in the causation of disease, but I think it will be conceded that the surgeon has not fulfilled the real purpose for which he was hired, if he removes two tonsils and leaves behind a mass of adenoids as large as either one of them.

This is the one place where I use the old-fashioned metal tonsil syringe with a curved needle, placed into the posterior vault of the naso-pharynx, and injecting 2 cc. of the solution above mentioned, at the same time that the tonsils are injected. Here also I would prefer a glass syringe, but it does not seem as convenient for reaching up behind the soft palate.

A La Force adenotome is insinuated sidewise through the pharynx and rotated to its correct apposition to the adenoids while passing behind the soft palate; before the blade is driven home the instrument is rocked from side to side so as to settle it well into place, and finally the handle is held firmly against the lower teeth, which causes the blade to get to the high point in the naso-pharynx where it is most needed. This procedure has not lengthened the operation by more than a minute. The largest sized adenotome is used in all cases, and under local anesthesia no attempt is made to curette away any of the tiny amount of adenoid tissue that may remain outside of the scope of the La Force adenotome after it has been rocked into place. Indeed I need only direct attention to the lingual adenoid tissue that is seldom disturbed and seldom causes trouble, to



make it clear that a small amount of adenoid tissue, unobstructively off to the side of the posterior nares, is a negligible factor. At the same time I will not attempt to justify these leavings by siding with those who believe that adult well-being requires that a certain amount of this adenoid tissue be left; that would be confusing the issue and conceding their argument for tonsillotomy instead of tonsillectomy. My aim, therefore, is complete removal within practical limits and to a practical effect.

Immediately upon the withdrawal of the adenotome a gauze sponge, which has been dipped into tincture benzoin composition, is rammed up into the naso-pharynx and held there for a minute or two, and this effectually stops all bleeding at that point. Some operators have the patient hold his head over a bucket and let the blood run. But surgery teaches conservation of normal tissue, and why waste one of the most important tissues of the body? The patient recovers either way, and it may not be a matter of life and death now, but who shall say what bearing it may have in some future crisis in the patient's life? So I stop the bleeding of the adenotome knife wound, and with no bleeding from the snare wire wound, the entire operation is practically bloodless.

This is not a 100 per cent method. It can be used in 99 per cent of young people, and 85 per cent to 90 per cent of adults. In the small remaining percentage, numerous past inflammations with the formation of abundant scar tissue and contractions, effectively prevent a free massage of the tonsil through the loop; the force of the massage should not be carried to the point of tearing the anterior pillar. The fact that there are some cases in which this method is not successful, is no more of an objection to it, than would be an objection to a scalpel of a general surgeon on the basis that he sometimes has to use a bistoury or a tenotome; the surgeon selects the instrument most suited to his immediate needs, and is versatile enough to discard one instrument for another on the spot according to the requirements of the case as he finds them. So I do not condemn myself to the use of my old-time favorite dissection instruments for all cases, but I have them there sterile and ready, but covered up out of sight of the patient, only to be used in that rare and small percentage of cases *where the inferior pole cannot be picked up in the loop of the Beck snare*. Just as the dimple in the anterior pillar is the index that the operation is complete, so inability to pick up the inferior pole of the tonsil in the loop of the Beck snare in the first instance at the very outset of the operation, is an index that the case at hand is best operated by some other

method, and no time need be wasted. If I have to dissect, I prefer an intact tonsil to a ragged or partial one, and inability to get the inferior pole with the loop means a dissection to me, no matter how temptingly easy the rest of the tonsil may appear to the use of the loop.

The Beck snare is preferred to the Sluder or a guillotin, because the blade of the latter is unyielding, and while frequently doing nice work, more frequently and unnecessarily it cuts and damages the musculature of the tonsillar fossa, and causes more bleeding at the time and afterwards when the effect of the adrenalin wears off. The same is true in a much less degree of a dissection and use of ordinary snare. The Beck instrument has the advantage of requiring no dissection at all—hence no part is unnecessarily cut or wounded—and combining with it the advantage of the snare, the wire of which flexibly follows the natural cleavage of the tonsil from its fossa, which is the path of the least resistance, and the tourniquet action of the screw handle slowly pinches off the blood vessels and the tonsil, acting as a hemostat. It is a split capsule operation. A teaspoonful of blood at the time is the limit, no gurgling and sputtering of blood, and nurses have frequently remarked that my local cases showed no after-bleeding, in contrast with those operated by other methods. The La Force tonsil instrument does not seem suitable for work under local anesthesia, and appears to me to be more complicated than the Beck with no special advantages, but I admit an unfamiliarity with its use.

Dr. Boetcher in discussing the Beck instrument, remarked to me that its use was not surgery, but that it was a trick instrument. But it does the business. As well say that a reaper with an automatic binder is a trick machine and not farming—it does the business. On the other hand, Dr. Burton Haseltine, who himself devised special instruments and a technique for tonsillectomies, after a period of doubt, has adopted this method for selected cases; and Drs. Leavy and Creveling of St. Louis, all of whom I had the pleasure of working with at Ft. Sheridan, have spoken quite enthusiastically of the instrument.

"This method has also been approved by Dr. L. S. Gumberts of Chicago, who does upwards of 300 cases a year, and uses the Beck snare exclusively with his general anesthetics."

#### SUMMARY.—LOCAL ANESTHESIA.

1. The main point in my technique is in what I do not do, that is customarily done, confining myself to two deep retro-tonsillar injections.

## THE TONSILLECTOMY.

2. A tongue depressor, a tenaculum and a Beck snare are all the instruments required, the technique of which is detailed above, making a practically bloodless and quick operation.

## ADENECTOMY.

3. The necessity for this is frequently overlooked in young adults; the anesthesia described is complete, the La Force adenotome makes a practically complete removal, the entire procedure of which does not add more than three minutes to the time of the operation. A sharp cutting blade being here employed there is bleeding as contradistinguished from the effects of a snare wire used in the tonsillectomy, but the astringent and particularly the pressure applied, makes this likewise practically bloodless.

4. A plea for less bloody tonsillectomies and adenectomies, following a principle of surgery requiring the conservation of healthy tissue; to say nothing of the psychological effects on the patient and operator.

5. Finally I would like to pay my respects to Dr. Jos. C. Beck of Chicago, to whose ingenuity the profession is indebted for an instrument which makes tonsillectomy a pleasure to both the surgeon and the patient.

## COMMUNICATION.

Editor LARYNGOSCOPE, St. Louis, Mo.

Dear Sir: Will you kindly give space to the following, in your next issue of THE LARYNGOSCOPE, concerning priority of originating new features in an instrument for bronchoscopy.

In THE LARYNGOSCOPE for August, just at hand, an article appeared by Dr. Wolfe Freudenthal of New York, in which he states a proposed instrument with a new drainage system for removing blood, pus, etc., from the bronchoscope without the use of a separate tube, making unnecessary the use of a separate tube. This is not a new feature, as the writer has used such an arrangement as Dr. Freudenthal describes for quite a while, and is one of the features of my instrument which I presented to the Section of Laryngology, Otology and Rhinology of the American Medical Association, at New Orleans, Friday, April 30, 1920, recorded in the minutes, notice of which appeared in The Journal, May 29th under caption, "Correction."

Also, the idea of a broncho-periscope is not new, as this is a feature of the same instrument, fully described at this meeting, as well as at various other meetings in which the instrument has been demonstrated and recorded in the minutes. In this instrument it is converted into a broncho-periscope by simply removing the jaw of the forceps, and inserting in its stead the metal mirror, which has the same mechanical construction and movements as the forceps jaw, throwing the light in any desired direction, whereby the sides of the broncho, as well as the openings of the smaller bronchi and their contents which are at right angles to the instrument, may be seen. This instrument has been perfected for many months and am informed that it is only a short time until it is to appear on the market and can be had by the leading surgical instrument dealers. Most respectfully,

A. E. GOODLOE.

## THE MOTOR NEUROSES OF THE LARYNX.\*

DR. GEORGE W. MACKENZIE, Philadelphia, Pa.

The neuroses of the larynx may be divided into two classes, the sensory and the motor. Having presented a paper on the subject of The Sensory Neuroses of the Larynx before the Philadelphia Laryngological Society recently, the writer desires to follow it with a paper on the subject of The Motor Neuroses on this occasion. The breadth of the subject is such as to permit of only limited reference to its various phases. There will be no attempt to present anything new at this time.

Disturbances of motility of the larynx may be divided into three forms, according to Schnitzler.<sup>1</sup>

- (a) Hyperkinetic motility disturbances.
- (b) Co-ordination disturbances.
- (c) Hypokinetic disturbances.

The hyperkinetic disturbances consist of spasm of the larynx, laryngeal vertigo, and nervous laryngeal cough.

### SPASM OF THE LARYNX.

Typically, spasm of the larynx occurs as a crisis. There is a cramp-like narrowing of the glottis, which is occasionally accompanied by muscular cramps of the extremities and the body. It occurs more frequently in children during the first two years of life. It may last from a few seconds up to two minutes, and terminates either in recovery or death. An average of 10 per cent of children subject to this condition die during one of the attacks according to the above-mentioned author. The cause has not yet been determined; however, most authorities find that children susceptible to spasm of the glottis show more or less evidence of rachitis, and they therefore believe that rachitis bears an etiologic relationship to the spasm. Besides rachitis there are found other evidences of poor nourishment, together with digestive disturbances combined with over-irritability of the central nervous system to peripheral stimulation. It is possible that dentition plays a part. The attacks are frequently preceded by a scream or a cry. In some isolated cases there have been found bronchial glands in the stage of caseation surrounding the recurrent nerve. In some other cases hyperplasia of the thymus gland has been observed. In one case of a child one year old the post mortem revealed a loose articulation between the occiput and atlas, that permitted of pressure on the medulla oblongata. These, however, explain only isolated cases.

\*Read at the Meeting of the Southern Section of the Triological Society, New Orleans, May, 1920.

Steffen's<sup>2</sup> explanation concerning the origin of spasm of the glottis is that in consequence of the general undernourishment of the child, the nervous system becomes pathologically irritable, while the misformed thorax, the product of the rachitis, causes a rather superficial and more rapid breathing than normal, which when taxed by the infant's sudden crying or screaming results in imperfect breathing, which in turn leads to a venous hyperemia of the brain and medulla oblongata sufficient to bring on an attack of spasm of the glottis. An attack may come on during sleep as well as when the child is wide awake. It is provoked by crying or by drinking water. It is ushered in with a few deep whistling inspirations. During the attack the glottis is completely closed, the child becomes rigid, cyanotic in the face, and looks about pleadingly for help; rarely is there a loss of consciousness. The pupils are dilated. The attack terminates with an audible inspiration of air. During the attacks there may be a momentary twitching in the facial muscles. The attacks vary in frequency, recurring every few days or as often as twenty or thirty times in a single day.

Spasm of the larynx may attack adults, but less frequently than infants. Hysteria is the more common cause in adults; next to this we find tabes, which is responsible for the so-called symptom complex referred to as a laryngeal crisis. It occurs also in tetany, epilepsy, chorea and hydrophobia when it is referred to a spasm of central origin. In the case of adults the spasm is less intensive than in children, and is designated laryngismus stridulus. Besides spasm of the glottis of central origin we have to consider those of peripheral origin. These latter may result from any lesion along the course of the recurrent nerve capable of producing a moderate degree of pressure upon it; for instance, aneurisms, enlarged deep cervical glands, enlargement of the thyroid gland and scars left after their removal.

#### LARYNGEAL VERTIGO.

According to Charcot,<sup>3</sup> laryngeal vertigo implies spasm of the glottis combined with vertigo followed promptly by loss of consciousness. Laryngeal vertigo, in the opinion of Thomson,<sup>4</sup> is that it is neither distinctly sensory nor a distinctly motor disturbance, but transitional between the two. Moure<sup>5</sup> credits this condition as occurring in lesions of the respiratory organs, especially spasmodic bronchitis, polypi of the larynx, besides in tabes, and even independently. According to the same author, it is probably due to the influence of cold, sudden changes of temperature, emotions, irritating vapors, alcoholic beverages, but mainly to a neurotic temperament. The attack begins with a sudden tickling sensation in the



throat which prompts a cough or a burning sensation in the throat. Vertigo follows promptly with loss of consciousness. Occasionally there is a slight twitching in the facial muscles. The attack lasts but a few seconds and may recur as often as several times a day. Laryngeal vertigo occurs more frequently in men than in women. The explanation of the vertigo may be found in a venous stasis in the internal ear due to the temporary suffocation, for it is a well-known fact that those who die from suffocation show venous hemorrhages in the internal ear. The prognosis is generally favorable so far as the attack itself is concerned.

#### NERVOUS LARYNGEAL COUGH.

Nervous laryngeal cough is generally understood to be either a constant rhythmic cough or a cough that comes in paroxysms without pathologic changes in the respiratory organs. The condition is brought about through an irritation in the region of the superior laryngeal nerve in individuals of excessive irritability. In a few cases it may be due to an increased irritability of the central nervous system. When considering the etiology of the so-called nervous laryngeal cough the presence of an enlarged lingual tonsil or excessively anteriorly scrolled epiglottis should not be lost sight of. The experience of the writer is that considerably more than one-half of the cases of this type of cough are ameliorated or cured by the removal of the enlarged lingual tonsil or a partial amputation of the excessively scrolled epiglottis, sufficient to break the contact. The etiology, according to Hajek and Schnitzler, is more commonly hysteria and neurasthenia. In certain cases they place the peripheral origin somewhere in the stomach, bowel, or genital organs, the latter especially among women. The increased reflex irritability of the individual must be considered in the treatment of these cases. In a certain number of cases the cough repeats itself at regular intervals and for a more or less definite length of time. The cough has a characteristic metallic sound, seldom of a coarse character. As a rule, it is manifested less in the daytime than at night. It occurs more frequently on going to bed. The more they cough the more they want to cough. After sleep overtakes them they rarely are awakened by it. During a conversation the cough frequently is interrupted, showing that the patient has some control over it, unlike the cough of chorea to which it has been likened.

The attack is frequently terminated with the successful raising of a slight amount of gluey-like secretion, assisted by slight retching. The affection can last for weeks or months, or even years, without producing any apparent detriment to the patient's general condition of health. Occasionally the cough may so traumatize the vocal

cords as to make them appear rather pinker than normal. Rarely a small hemorrhage appears which may give to the larynx the appearance of a mild grade of catarrhal laryngitis.

#### INCO-ORDINATION OF LARYNGEAL MUSCLES.

Inco-ordination of the laryngeal muscles occurs in two forms—phonetic cramp and inspiratory cramp. When that perfect synergism of muscular action that prevails in the larynx of the normal individual is lacking, there occurs inaccurate movements which we may properly designate inco-ordination. The pathology in most cases is not exactly known; however, we do find that this condition may be found in hysteria, neurasthenia, less frequently in multiple sclerosis or some peripheral lesion, according to Krause,<sup>8</sup> quoted by Schnitzler. Two forms are recognized: (1) phonatory glottis cramp (aphonia spastica) and (2) inspiratory glottis cramp. The phonatory glottis spasm is produced by a cramp-like super-adduction of the vocal cords, preventing the production of a tone. In mild cases the voice appears as though it were compressed. In their efforts to produce a sound the face becomes quite red, and occasionally even cyanotic. The laryngoscopic picture shows different grades of cramp; the ligamentous portion of the cords is always in close contact during attempts at phonation. In some cases the vocal cords overlap. The adduction may be so forceful as to bring the false cords quite in touch with one another. Occasionally the adduction includes the cartilaginous part; more often, however, there is a small space left posteriorly to permit of respiration, imperfect though it may be. The closure may be so complete as to produce dyspnea. The muscles of phonation are not the only ones involved. The cramp-like contraction of the muscles involve also those of respiration. In cases of pronounced degree the patient is unable to produce any noise whatever. More often, however, the spasm is less pronounced; frequently pain is experienced in the region of the sternum and larynx. The prognosis is generally unfavorable so far as permanent recovery is concerned, for there is a tendency to recurrences even years after apparent recovery.

#### INSPIRATORY GLOTTIS CRAMP.

In glottis cramp of the phonatory type, the inco-ordination results from a motor innervation decidedly in excess of that which was intended; the disturbance, therefore, is a quantitative one; on the other hand, in the case of glottis cramp of the inspiratory type, the inco-ordination results from a motor innervation of certain muscles (adductors) not intended in addition to those (abductors) which were intended; the disturbance, therefore, is a qualitative one. The innervation of the adductors overbalances the inner-

vation of the abductors, with a result contrary to the patient's intention. The prolongation of the adduction brings about respiratory dyspnea. In the meantime phonation remains quite normal.

Patients affected with so-called inspiratory cramp may breathe quite normally when taking life quietly, but the slightest exertion is liable to bring on an attack of dyspnea.

The immediate prognosis of inspiratory cramp is favorable however it tends to become a chronic affection. Inspiratory cramp tends to yield more readily to treatment than does the phonatory cramp. The cause of inspiratory glottis cramp is to be found in one or other of the neuro-psychopathic conditions which appeal more for general treatment of the patient than local attention to the larynx.

Besides the phonic and inspiratory glottis cramps referred to there occur isolated cases of co-ordination disturbances of the larynx that do not belong strictly to one or other of the two forms mentioned. One of these disturbances is that found in certain over-sensitive individuals during the first attempts at a laryngeal examination which consists of a unilateral inspiratory cramp. During inspiration the cord of the affected side does not adduct, or does so but feebly. The appearances resemble that of unilateral paralysis of the posterior crico-arytenoid muscle (abductor). The condition, however, is quite the opposite, for it is due to a spasm of the adductors and not a paralysis of the abductor.

A second atypical form observed by Krause<sup>6</sup> is shown as ataxia of the vocal cords and is met with in tabes. It consists of an imperfect adduction of the cords during attempts at phonation. They adduct only partially and remain so.

A third form has been referred to by Baginsky<sup>7</sup> as a nystagmus of the vocal cords. It is found in hysterical patients and is manifested by rhythmical jerky movements of the cords occurring at the end of each expiration. The number of such movements is approximately fifty a minute.

A fourth form consists of rhythmic jerky movements of the vocal cords, found in cerebro-spinal meningitis and paralysis agitans.

#### HYPOKINETIC MOTILITY DISTURBANCES (PARESIS AND PARALYSIS).

Paralysis of the intrinsic muscles of the larynx can occur in many forms and from many different causes. It can occur from an affection of the muscle itself, when we speak of it as a paralysis of myopathic origin. More often, however, the cause is to be found in some affection of the peripheral nervous system; that is to say, from a lesion that may happen along the course of the pneu-

mogastric nerve, from its superficial origin in the medulla oblongata to the points of final distribution of its superior and inferior (recurrent) laryngeal branches. Furthermore, the cause may be located in a lesion of the brain substance anywhere along the tracts from the deep origin of the pneumogastric nerve in the medulla to its terminals in the cerebral cortex. When the lesion responsible for paralysis is located in the brain it is referred to as a paralysis of central origin.

A paralysis of an isolated laryngeal muscle is of rare occurrence. More often the paralysis involves a group of muscles. As a rule, it involves either a group of muscles that functionate together; for instance, the adductors or else a group of muscles supplied by a particular nerve.

#### SUPERIOR LARYNGEAL NERVE PARALYSIS.

Recalling the fact that the superior laryngeal nerve supplies sensation to the upper part of the larynx down to the level of the vocal cords and also the motor impulse to the crico-thyroid muscle, we would expect to find in a case of a destructive lesion of this nerve loss of sensation in the above-mentioned part of the larynx, together with paralysis of the crico-thyroid muscle, the function of which is that of an accessory tensor of the vocal cords. In the case of a unilateral lesion of this nerve the cord on the affected side would be less tense than its fellow, while its free margin would present a more or less wavy outline. During inspiration it would tend to sag in the middle, and during expiration it would be blown proportionately upward. In the case of unilateral paralysis of this nerve there occurs also loss of power of the thyro-epiglottic and the ary-epiglottic muscles, according to Morrell Mackenzie.<sup>8</sup> The voice is not materially affected in the case of a unilateral lesion of the superior laryngeal nerve; on the other hand, in the case of double-sided lesion we find the voice feeble, rough, toneless and easily tired (Sinclair Thomson). It is quite impossible for the patient to produce the higher tones. In a case of bilateral superior laryngeal nerve paralysis there is a complete loss of sensation on both sides of the larynx. Because of loss of sensation in the larynx the patient suffers considerably from difficulty in deglutition; besides, there is the risk of food entering the trachea and lungs, with pneumonia following.

Paralysis of the crico-thyroid muscle may be of myopathic origin resulting from intensive catarrhal inflammation of the larynx extending to the deeper structures, aggravated by excessive use of the voice. Moure (p. 275) mentions a case seen by Tuerck<sup>9</sup> of crico-thyroid atrophy without a concomitant lesion of the superior

laryngeal nerve which proves that the case must have been one of myopathic origin. Most authorities agree that impairment of function of the superior laryngeal nerve results from diphtheria, in which case the immediate prognosis may be unfavorable in a few cases but ultimately good in the large majority. Isolated paralysis of the superior laryngeal nerve is a very rare occurrence, for the reason that an affection of the vagus just above the branching off of the superior laryngeal nerve would necessarily involve the recurrent along with it. Mygind<sup>10</sup> found only thirteen cases in the literature.

#### INFERIOR (RECURRENT) LARYNGEAL NERVE PARALYSIS.

Isolated paralysis of the recurrent laryngeal nerve is a decidedly more frequent occurrence than isolated paralysis of the superior laryngeal nerve. Furthermore, involvement of one recurrent nerve occurs decidedly more often than bilateral involvement. Cases of bilateral involvement of the recurrent have been reported by Ziemsen,<sup>11</sup> Tuerck,<sup>12</sup> Traube,<sup>13</sup> and others mentioned by M. Mackenzie. E. O. D. Davis,<sup>14</sup> of Charing Cross Hospital, recently reported a case of centrally caused bilateral abductor paralysis in tabes, together with the post-mortem findings. H. E. Miller<sup>15</sup> reported a case of bilateral peripheral paralysis of the postici.

The cause of recurrent nerve paralysis may be located in the medulla or the tracts leading from the medulla to the cerebral cortex when it is referred to as a lesion of central origin. A cortical lesion responsible for paralysis of the vocal cords is extremely rare; while its possibility is doubtful in the mind of some authors, for the reason that the cortical innervation is generally understood to be bilateral. Mackenzie refers to incomplete paralysis caused by double aneurism which he has found in several instances. Also, cancer of the esophagus and cancer of the thyroid gland.

The medulla is by far the most frequent site for a lesion of the so-called central origin form. Bulbar lesions are not uncommon and include tumors, syphilomes, tubercles, progressive paralysis, bulbar palsy, pseudo bulbar palsy, multiple sclerosis, tabes, anterior poliomyelitis.

Recurrent nerve paralysis also may occur from a peripheral lesion, a lesion located anywhere along the course of the pneumogastric nerve from its superficial origin in the medulla to the final distribution of its inferior (recurrent) laryngeal branch, among which may be mentioned tumors at the base of the skull pressing upon or involving the pneumogastric nerve, extra-cranial pressure upon or direct injury to the pneumogastric or its recurrent branch, growths in the neck close to the exit of the nerve from the skull,



aneurism of the internal carotid, suppuration of cervical glands; while operative injury following ligation of vessels (stab wounds in the neck), removal of glands including the thyroid are not uncommon. Thomson credits diphtheria as causing recurrent paralysis from a lesion in the medulla, while Mackenzie, quoting Schech, credits post-diphtheritic paralysis as due to fatty degeneration of the pneumogastric nerves and their recurrent branches in a case of bilateral paralysis. Among those located lower and selecting the recurrent branch may be mentioned carcinoma of the esophagus affecting one or both sides, pericardial exudate with enlarged heart involving one or both sides, aneurism of the arch of the aorta involving the left side, aneurism of the sub-clavian artery involving the right side; in cases presenting aneurism of both of the vessels there may be bilateral involvement of the recurrences. Thomson mentions as factors in the causation of left-sided recurrent paralysis large pleural cancer with effusion, enlarged bronchial glands and disease of the mediastinal glands. As factors in right-sided paralysis may be mentioned pleuritic thickening at the apex of the right lung and lesions about the innominate artery and right sub-clavian.

The recurrent laryngeal nerve supplies all the muscles of the larynx with the exception of the crico-thyroid. They include the crico-arytenoideus posticus, the only abductor muscle of the larynx; the crico-arytenoideus lateralis, an adductor muscle and direct antagonist of the posticus; the arytenoideus, called by some the inter-arytenoideus muscle, an adductor of the arytenoid cartilages posteriorly; the thyro-arytenoideus externus and internus are tensors of the vocal cords, and are assisted in their action by the crico-thyroid, which fixes the thyroid cartilage.

Unilateral paralysis of the recurrent nerve is one of the commonest forms of motor neuroses of the larynx; furthermore, incomplete paralysis is met with more often than complete paralysis. On account of the relative mildness of the resulting symptoms, recurrent paralysis is often overlooked, at least by the general practitioner. In the case of complete paralysis of the recurrent of one side there is a moderate narrowing of the glottis during respiration by reason of the imperfect abduction of the vocal cord on the affected side. Enough space is left, however, for ordinary respiration and quite sufficient for forced respiration, providing there is no complicating laryngitis. Very few, if any, of the cases of unilateral complete paralysis of the recurrent nerve seek attention on account of dyspnea, but rather because of voice disturbances. In unilateral complete paralysis the disturbance in the voice is more

evident in the beginning of the trouble than later, for the reason that the vocal cord of the sound side eventually acquires the ability to super-adduct sufficiently to compensate for the loss of power of adduction of the affected cord. The result is a distinct improvement in the power, if not in the timber of the voice. On the whole, a unilateral complete recurrent paralysis is a mild and unimportant affair in itself. On the other hand, a bilateral paralysis of the recurrents is a very serious one and may endanger life by urgently threatening suffocation (Bruck). The commonest cause of bilateral recurrent paralysis is *tabes dorsalis*. The paralysis comes on gradually as a rule. The patient is embarrassed in his breathing only after some bodily exertion. The inspiratory dyspnea increases gradually until eventually the slightest incident, such as a catarrhal laryngitis, will prove sufficient to occasion the most serious danger. Expiration is less embarrassed than inspiration.

Bilateral incomplete paralysis of the recurrent nerves gives rise to abductor paralysis with more or less preservation of function of the adductors. The natural tonus which is ever present in all healthy muscles, so long as the individual is not narcotized or unconscious, leaves to the unaffected adductors the balance of power, with the result that the vocal cords assume the position of adduction. The glottis space is narrowed, considerably more so than in a case of complete paralysis where the adductors are paralyzed along with the abductors. It follows, therefore, that so far as embarrassment of breathing is concerned, an incomplete bilateral recurrent paralysis is a decidedly more serious affair than a complete paralysis, for the reason that in complete recurrent paralysis the vocal cords are not adducted, but assume the position more or less midway between adduction and abduction, the so-called *cadaveric* position.

In bilateral incomplete recurrent paralysis there is more narrowing of the glottis and consequent dyspnea than in the case of complete paralysis where the function of adduction is lost. For the same reasons the voice is well preserved in the incomplete and lost in the complete paralysis.

Concerning functional paralyses of the laryngeal muscles in contradistinction to those of organic origin, Semon-Rosenbach's law still holds good; namely, that in all functional paralyses of the larynx the constrictors of the glottis (adductors) are almost always affected; in all the organic and progressive organic paralyses, whether central or peripheral in origin, the dilators of the glottis (abductors) are at first or exclusively affected. Theories have been offered at odd times by different authorities to explain the working of this law; as yet none has been sufficiently satisfactory to be

generally accepted. Bruck claims that there are exceptions to Semon-Rosenbach's rule, and quotes Saundby's case in support of his contention. It was a case of esophageal carcinoma affecting both vagi and recurrences. The function of the abductors prevailed over the adductors until the last moment and the glottis stood open all the time.

In bilateral adductor paralysis (hysterical paralysis of the laryngeal muscles, aphonia hysterica) both cortical centers of phonation are, as a rule, affected, and the automatic centers in the medulla remain unaffected (Bruck). The paralysis concerns only the adductors which are subject to the will. They are able to speak but in a whisper. On the other hand, reflex coughing and laughing remain as loud as normal. Women are more prone to be affected with hysterical aphonia than men, especially during pregnancy and at the climacterium. The onset is rather sudden; it endures for a variable period, in some few cases for months, and terminates as suddenly as it commenced. The examination of the larynx reveals a triangular space posteriorly during attempts at phonation because of inaction of the arytenoideus. At times there occurs a vicarious adduction of the ventricular fold. In some cases the thyro-arytenoideus interni are principally involved, or involved alone, so that the cords present a bowed appearance during attempts at phonation. During respiration the vocal cords are seen to functionate perfectly.

The attempt has been made to make the paper brief enough to fit into the fifteen minute allowance, which explains the reason for the incompleteness of a paper dealing with so broad a subject.

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1831 Chestnut St.

## A CONDEMNATORY NOTE ON THE USE OF PARAFFIN IN COSMETIC RHINOPLASTY.

DR. SEYMOUR OPPENHEIMER, New York City.

It appears that the subcutaneous employment of oil and liquified paraffin has been known for some years, and Corning in 1891 makes reference to his use of solidifying oils in surgery. However, Gersuny in 1900 was the first authority of note to advocate the use of paraffin injections for prosthetic purposes, and his advocacy of its use led to widespread interest in the subject, so much so that the method was taken up with marked enthusiasm by surgeons both in Europe and in this country. The advantages claimed for the method were that the operation was practically without pain, caused no scars when the proper injection technique was followed, and corrected nasal deformities that could not well be overcome otherwise. That considerable enthusiasm was manifested in the subject of paraffin injections for cosmetic purposes, is evidenced by the detailed text-book descriptions of the technique, and also by the numerous case reports which began to appear in the literature. The method was taken up by a good many skilled and well-recognized surgeons and rhinologists, but the charlatans, the advertising "beauty doctor" and others of that ilk were quick to see the possibilities in a financial sense in its appeal to the popular imagination, and seized upon the method with avidity, and with this added to their armentarium reaped, and still reap, a harvest from their willing victims amongst the laity. While paraffin injections for cosmetic purposes still continues to be employed by a good many well qualified surgeons and rhinologists, its widespread employment by the advertising "beauty doctor" tended to cast ill repute upon the method, and as case reports of untoward results have come into the literature with unpleasant frequency in late years, its first burst of widespread popularity has waned considerably. Time has afforded a proper perspective, and while paraffin injections may still have a certain place in some few cases, it seems only necessary to point out some of the many untoward results reported, to justify condemnation of the method in toto.

Some of these untoward results collected from various sources are toxic absorption or intoxication after paraffin injection, variously attributed to impure paraffin employed; inflammatory reactions of marked degree; loss of tissue from sloughing; pressure necrosis; air embolism and paraffin embolism; primary diffusion

or extension of paraffin into other tissues; interference with action of the alar muscles and consequent embarrassment of respiration; leakage of paraffin after injection; paraffin absorption and disintegration with loss of the cosmetic result attained, partly or in toto; dermal hyperemia and hypersensitiveness, and in some cases a breaking down of the tissues with abscess formation. Cases of retinitis, optic neuritis and of sudden blindness after paraffin injection have been reported, and from the long series of untoward results and oftentimes serious complications reported in the literature, it would seem that the death knell of this method of cosmetic rhinoplasty must be sounded amongst the leaders in this special field, and with a campaign of education extending through the profession to the public, that same public may be made aware of the fact that this paraffin method of cosmetic rhinoplasty is dangerous even in the hands of the well equipped surgeon, and doubly more dangerous and to be avoided at the hands of the ignorant, unscrupulous and uneducated "beauty doctor."

#### LOCAL ANESTHESIA BY QUININE SALTS AND THE COMMITTEE REPORT.

To the Editor: The valuable report of the Committee of the Section of Laryngology, Otology and Rhinology on local anesthetics is before me. The committee states that quinine-urea, so far as nose and throat operations are concerned, has practically gone into "innocuous desuetude." Inasmuch as I first published cases of adenectomy and tonsillectomy operated under quinine anesthesia, may I be allowed to make the following statement:

My paper was published in the Journal in 1908 (I. I., p. 496). During the following twelve years I have injected tonsils and adenoids with no other drug. During the earlier years I was sometimes annoyed by edema and a slight amount of sloughing. I was using three grains of the quinine hydrochloride in two drams of water. Since reducing the strength of my solution to one and a half grains to two drams I have had no reason to complain of my results. My technic is as follows: Half an hour before operation the patient is given from four to eight drops of a 1/10 of 1% solution of scopolamin under the tongue. One-half of a three-grain powder of quinine hydrochloride is freshly boiled in a spoon with sufficient water (distilled) to fill my 2-dram syringe. The tonsil to be removed, with its pillars, is thoroughly massaged with a stiff applicator wound with a very small amount of cotton with a minimum amount of 20% cocain kept sterile by 1% phenol. This is repeated three times at two or three minute intervals, after which the quinine solution containing two or three minims of epinephrin solution is introduced with a short straight needle deeply into the supra and infra tonsillar regions as well as through the pillars. After ten to fifteen minutes the anesthesia is generally entirely satisfactory to both patient and surgeon. The complete absence of toxic symptoms would seem to make this as nearly a fool-proof method as any that has been devised, and in view of the fact that surgeons will not always be able to throw the responsibility for tragedies upon druggist or nurse, I believe the method is entitled to a better fate than "innocuous desuetude."

EDWARD J. BROWN.



## THE DEAF.

PROF. JOHN DUTTON WRIGHT, New York.

Something over three thousand pupils in the schools for the deaf of the United States entered those schools between the ages of six and ten without language and speech, and without the mental development that comes with the acquisition of language, who might have come to those schools with a considerable understanding of language and perhaps some speech if every physician was awake to the practical application of the laws of sound transmission that he was taught during his preparation for his profession.

It would be an immense boon to thousands of deaf children not yet of school age, and tens of thousands not yet born, if all practicing physicians could be made to clearly instruct the parents of children with seriously impaired hearing in the simple procedure that in thousands of cases would result in developing a hearing vocabulary in children who are at present deaf-mutes at seven years of age.

Children acquire their early language by hearing what is spoken to them, or in their presence. Practically all of this spoken language is uttered at least three feet from their ears and most of it at much greater distances. The distances of ordinary social intercourse are from five to fifteen feet.

Now every physician learned in high school, or in college, that the force with which sound waves impress the hearing mechanism varies inversely as the square of the distance from the source of the sound to the ear.

A word spoken to a child one yard from his ear makes a certain impression on his hearing mechanism. The same word spoken in the same pitch and volume one inch from his ear will make twelve hundred and ninety-six times as much impression upon his hearing organ.

A child may easily suffer from hearing so seriously impaired that he cannot hear words spoken in ordinary tones a yard from his ear and yet could hear them if they were spoken loudly and clearly an inch from his ear.

Practically every case of seriously impaired hearing in little children is known to some physician before the child is three years of age and very many at a much earlier age. At least one-third of all the children who are proper candidates for schools for the deaf have

some residue of hearing power. In every case procedure should be on the supposition that there may be some remaining power of sound perception till long experiment has proved it otherwise.

The moment impairment of hearing is suspected in a child by the family physician he should insist that the parents and friends conduct their intercourse with the child in a loud, clear voice *at very short distances from his ear*. He should impress upon them the immense desirability of taking extraordinary pains that the little child shall hear, at distances of an inch or two if necessary, all the every-day language that any other child hears from morning to night. If they are educated and intelligent people he can explain why; if not, he need only tell them the salvation of the child depends upon it. As a matter of fact the physician's own salvation ought to depend upon his performing this service.

If the parents will talk to the little child while facing a big mirror and holding their mouths very near his ear he can then both see their lips and hear their voices and so get double help by means of both ear and eye.

If the simple procedures were faithfully followed with every deaf child from early infancy to school age thousands that now reach the school door as deaf mutes would come merely as hard of hearing children with well developed minds ready to benefit to a vastly greater degree from the special instruction provided for them at great expense by the states. Many who are now suitable candidates for the special schools for the deaf would no longer be so, but could enter the ordinary public and private schools.

This message should be printed in every medical paper in the country and repeated at intervals till every physician was thoroughly aroused not only to his power of helping, but also to his *imperative duty to help*.

1 Mt. Morris Park, West.

## BOOK REVIEWS.

**PORTER—Diseases of the Throat, Nose and Ear.** By W. G. Porter. Third edition fully revised under the Editorship of A. Logan Turner, M.D., Ed., F. R. C. S.; Ed., Consulting Surgeon Edinburgh Eye, Ear and Throat Infirmary; Lecturer on Diseases of the Ear and Throat, University of Edinburgh, and Surgeon Ear and Throat Department, Royal Infirmary, Edinburgh. With 79 illustrations, 44 in colors. Cloth. John Wright and Sons, Ltd., Bristol, England, publishers.

In 1912, Dr. W. G. Porter produced his small text-book on Diseases of the Throat, Nose and Ear. During his absence on active service with the British Army in 1916, a demand was made for a second edition. The necessary revision was kindly undertaken by Dr. P. McBride. The second edition being now out of print, a further request is being made upon the publishers.

Major W. G. Porter, D.S.O., while serving with the Royal Field Artillery in France, was killed in action on June 8, 1917.

His old friends and former colleagues in Edinburgh being desirous that his work should continue to fulfill the useful purpose which it has enjoyed for seven years, have undertaken willingly its revision, so that it is now possible to publish the third edition. Some alterations in and enlargement of the original text have been made, especially in connection with the vestibular tests; the rearrangement and amplification of the sections describing Suppuration in the Labyrinth and the causative factors of Nerve Deafness have been made; the chapter on Chronic Catarrhal Deafness and Otosclerosis has been thoroughly revised; the chapters on the Pharynx and Nasopharynx and also those dealing with the diseases of the Nose have been brought up to date, as has also the chapter on diseases of the Larynx and the chapter upon the Nasal Accessory Sinuses.

M. A. G.

**SKILLERN—Accessory Sinuses of the Nose.** By Ross Hall Skillern, Professor of Laryngology Medico-Chirurgical College, Post-Graduate School, University of Pennsylvania; late Lieutenant-Colonel, M. C., U. S. A.; Fellow of American Laryngological Society; Fellow of the American College of Surgeons; Fellow of the American Laryngological, Rhinological and Otological Society; Fellow of the New York Academy of Medicine, etc., etc. With 300 illustrations. Cloth. J. B. Lippincott Co., Philadelphia, publishers.

The author's preface expresses tersely the circumstance of this third edition: "Since the appearance of the second edition of this work some three years ago, the medical world of Europe has been so convulsed by the great conflict of nations that little which did not pertain to war surgery (at least as far as our subject was concerned) found a place of publication \* \* \*. While in the service, the author was particularly interested in the influence of diseased sinuses on the general system, especially the amount or degree of incapacity produced in the individual, and later, while with the American Expeditionary Forces, with the injuries and wounds of the sinuses themselves. These, as far as they are of interest in civil life, have been incorporated in the new edition as well as additions of new treatment and surgical procedures which have been proven of sufficient merit." Clinically and practically this volume is thoroughly up to date and we can conscientiously reiterate all that was said of it in our review of the previous edition.

M. A. G.

**OSNATO—Aphasia and Associated Speech Problems.** By Michael Osnato, Associate in Neurology, Columbia University; Consulting Physician, Manhattan State Hospital and Central Islip State Hospital; Neurologist, Italian Hospital; Assistant Visiting Physician, Kings County Hospital; Assistant Chief of Clinic, Vanderbilt Clinic Department of Neurology. Cloth, \$2.50. Paul B. Hoeber, New York, publisher.

The author attempts to revise the conception of aphasia as it is now usually understood and endeavors by clinical reference to specify cases and by the personal observations of the author to corroborate the broad viewpoints which have been advanced. The book begins with an abstract of Villiger's conception of speech development; then follows a diagrammatic conception of the speech center and a diagram of sound language and written language; speech disturbances in the child; fallacy of the diagrammatic conception; aphasia as an intelligence defect; aphasia and apraxia; the psychology of voluntary movement and speech; the modern conception of speech; disturbances of speech in the functional conditions, emotions and fatigue; the influences of mimicry on speech; cerebellar speech disturbances and, finally, new cerebellar functions. It is an interesting dissertation and reflects much original thought and is worthy of careful study by all oto-laryngologists interested in the problems of defective speech in its many phases.

M. A. G.

**SCHAEFFER.—The Nose, Paranasal Sinuses, Nasolacrimal Passage ways, and Olfactory Organ in Man. A Genetic Development and Anatomico-Physiological Consideration.** By J. Parsons Schaeffer, M.D., Ph.D., Professor of Anatomy and Director of Daniel Baugh Institute of Anatomy, Jefferson Medical College, Philadelphia. With 204 illustrations, 18 in colors. Sq. 8vo. Cloth. \$10.00, postpaid. P. Blakiston's Son & Co., Phila., publishers.

This study of the embryology, development and anatomy, both microscopic and macroscopic, of the human nose, paranasal sinuses, the olfactory organs and certain other auxiliary structures, is based on the results of research work by the author since 1907 at Cornell, Yale and Jefferson Medical College. A number of papers have been published from time to time and these together with the text, diagrams, tables and illustrations of heretofore unpublished matter are now presented in this completed form. Most of the illustrations are based upon preparations, reconstructions and dissections by the author and reproduced by him or under his direction.

This excellent monograph offers a valuable and liberal education to every rhinologist for a proper groundwork and understanding of his many clinical and pathological problems. Our literature has contained but comparatively little of this important structural data and the production of this really valuable monograph should be received with much enthusiasm and gratitude. The illustrations are of finest quality and clarity and the details of paper, presswork and binding are commensurate with the high scientific merit of this volume.

M. A. G.

## THE NEW YORK ACADEMY OF MEDICINE.

SECTION ON OTOTOLOGY.

April 9, 1920.

Two Cases of Sinus Thrombosis. Presented by DR. KOPETSKY.

### DISCUSSION.

DR. HARRIS expressed gratification at the opportunity of seeing and hearing about these cases, and congratulated Dr. Kopetsky on the results obtained, particularly in the case of the little girl. He had been especially interested in what Dr. Kopetsky had said about primary thrombosis, and would like to know on what he based his views. All were acquainted with Dr. McKernon's paper on that subject, in which he reported a series of cases on which he operated. This case was especially puzzling, and Dr. Kopetsky had no reason whatever to be ashamed of the scar. It was also to be hoped that he would report further in the matter of the nerve involvement. The incision described was very generally known as the Boston incision and obtains there very generally. It is in many ways preferable to the one usually employed here, since, as Dr. Kopetsky said, it permits fully as good an exposure of the field, shortens the operation, and leaves less after deformity.

DR. R. C. MYLES said that it was remarkable that Dr. Kopetsky was able to accomplish so much with such good results. The surgery was perfect. As to the method of incision, he himself and those associated with him had been in the habit of employing that incision in all cases connected with the cervical glands, with wonderful results. It was to be heartily commended.

DR. KERNAN said there seemed to be two possibilities in regard to the nerve supply in the region affected, which might help to explain the condition. One was the ariculo-temporal branch of the mandibular nerve which comes out at the parotid gland behind the joint and turns up in the temporal region and supplies the auricle and drum membrane; the other branch was the auricular branch of the pneumogastric which passes through the jugular bulb and is distributed to the posterior part of the auricle. Either of these might be involved in such an inflammation as Dr. Kopetsky reported. The auriculo-temporal forms an anastomosis with branches of the facial in the parotid gland and so distributes sensory fibres to the region supplied by the facial. Through these fibres pain might be referred to the face.

DR. HAYS asked about the course of the incision.

DR. KOPETSKY, closing the discussion, said that Dr. Harris was right, as usual, concerning the origin of the incision. It was difficult to see why it had not been more generally adopted in New York, since it gives just as free a field for operation and a much better result, and it is besides much easier; one cannot get lost anatomically for there is a cross view of the field.

As to primary bulb thrombosis, we all owe much to Dr. McKernon's classic exposition of that subject. The diagnosis is made in these cases by the septic clinical picture, elimination of all other sources of infection plus positive blood culture. With a septic temperature and a positive blood culture one is justified in making the diagnosis, and that was how this case was regarded even though the culture was negative. At present there is a case in the hospital with primary bulb thrombosis, where culture was positive. It is said that the personal equation enters into the estimation of cultures; so it does, but when different men, all experts, have taken it, and all agree in the findings, that cannot be said to enter the case. These cultures were taken by Dr. Max Kahn, a per-



fectly competent man, and by Dr. Unger, both reporting it negative. Whenever the findings are unusual, every effort is made so far as possible to avoid relying upon one report, for any one is liable to make a mistake; these findings were all checked. Dr. Kopetsky said he could add nothing further to the presentation of the facts in these cases. They should be noted in the literature, for when endeavoring to explain the pain a careful search was made but no explanation would be found. The child could not eat and was losing steadily, and something had to be done. When the tension was relieved, the pain disappeared.

**Some Remarks on Group Study in the Surgery of the Head.** From Dr. SEYMOUR OPPENHEIMER'S Abstract.

The great scope of modern medicine precludes maximum efficiency in all branches on the part of one person. Group study and practice present the means for providing this needed efficiency for universal enjoyment.

In head and neck surgery the ophthalmologist, otolaryngologist, cranial surgeon, neurologist, dental surgeon, internist, roentgenologist, pathologist and bacteriologist cover the fields whose work must be combined for completely satisfactory results.

The ophthalmologist deals, for example, with so closely circumscribed a field and one which reflects so many possible systemic or focal conditions outside of this field that the assistance of the consultants is essential in differential diagnosis. Frequently the most careful group study is necessary in differentiating a sinusitis from an intracranial lesion though either may be made manifest through headache and eye changes alone.

So, too, with each of the specialties mentioned, problems arise which can be solved correctly only by summoning the other members in consultation. Especially well demonstrated has been the value of the otologist to the neurologist in localizing a lesion as between the cerebellum and the labyrinth by means of the more recently developed ear tests.

There are undoubtedly conditions where these extensive studies are not indicated but many more occur in which the brief review of the case by the balance of the group would reveal important conditions which would otherwise be overlooked to the detriment of the patient.

The dentist today is assuming and should assume a much more important function than that of extracting or filling teeth as these very practices have so much bearing on the welfare of the patient.

The skilled roentgenologist is an ever more important member of the group as his field develops newer and better methods of head work and interpretation.

The laboratory worker with all the methods at his command is increasingly well recognized as a necessity in really complete, satisfactory, exhaustive study.

It is then evident that by combining the results of laboratory tests and close clinical observation and correlating them under the guidance of the group we can hope to elucidate the complex and often obscure symptomatology and secure results to which our patients are justly entitled. Nowhere is this revolution in practice more needed than in head and neck surgery.

**Group Study in Head Surgery.** DR. SEYMOUR OPPENHEIMER.

DISCUSSION.

DR. HARRIS said that Dr. Oppenheimer's paper deserved very properly the rather abused word "timely," for as stated, we in New York are far behind our confreres in the West in this matter of group surgery. The paper was a very careful and comprehensive enumeration of the points involved; the essayist seemed to leave nothing out to remind one of the close relation of the head to other parts of the body, and the case was admirably submitted.

There were one or two points, however, which the subject as presented immediately suggested, and looking at the portrait of the late Dr. Gruen-

ing whom we all loved and admired one recalled how he used to say that the aid of the laboratory, the X-ray, and any other test available should be invoked, but that these should never be relied upon to the exclusion of one's own clinical knowledge. He was undoubtedly right. One should never allow himself to make use of aids to enable him to lie down upon the specialist in one or another field of work, and that is the tendency to be feared in group surgery. With all of its admirable features one must be on guard in regard concerning the aid given by the X-ray. The X-ray specialist submits a routine report, and on that, often without any further investigation, a diagnosis is built up which may or may not be correct. Dr. Law is a very strong exponent of the view that any clear and valuable or worth while interpretation expressed by the radiographer must be based for the most part upon the data furnished to him and that he can very easily go wrong when he draws his conclusion without any knowledge of the case clinically. That was merely one illustration of this point—the necessity for the closest possible co-operation between all concerned in a case. That should be particularly emphasized.

The essayist did not touch upon the economic features of the subject, and yet that is very important. How is this work to be carried out practically? It must be done by getting together, by being closely in touch with each other. We are all in the habit of getting aid when we need it; that is not new; for years we have been getting help from the laboratories and other men when required. But as generally understood group surgery, as at the Mayo Clinic, means a systematic inquiry into every feature of a case; everything is thoroughly investigated and laid before the man concerned. It is only by close inquiry and by giving all the information we can to the specialists that we are going to arrive at a proper conclusion. It goes without saying that the best results in head surgery are not going to be obtained by working with colleagues scattered all over a great city like this. The Mayos have brought out the idea that it is done best in a compact field, and this was further demonstrated by those who worked together in the army, and were able to use the laboratories and other aids in a scientific way. The same idea is illustrated by the clinic which has been established on the West Side, which is a demonstration of what is being done in Chicago. It is an incentive to us to organize in the same way, but we should bear in mind the risk—the risk of depending too much on the confrere to whom we send a case for an opinion. It is only by intelligently comparing his views with our own knowledge of a particular case that we can form our own conclusions and arrive at a proper diagnosis.

DR. DUDLEY E. MACKEY said that all are aware of the fact that medicine and surgery cover too wide a field for any individual to intelligently do justice to it all. Roentgenology has reached a place in the practice of medicine and surgery where it requires a specially trained man. It does not mean the mere exposure of the plates and being able to develop and finish it, but it requires a man who has been trained by continuous observation of plates and shadows. This technique and ability cannot be acquired except by study and the association of the Roentgenologist with the surgeon to verify the diagnosis. A few facts may be mentioned that have some bearing upon the subject under consideration and to emphasize the necessity of Roentgenology as a specialty in head surgery.

In discussion Dr. Oppenheimer's paper with reference to the use of the X-rays as an aid to the diagnosis in pathology of the accessory sinuses and bone lesions of the head, and its relation to the group practice of medicine, stress must be laid upon two points: first, the importance of correct technique; second, the correct reading of the shadows in evidence.

It is very essential in the making of the plate that the sinuses are placed in such a position that the areas involved can be compared with the normal. In the frontal sinuses, for example, unless the comparative

technique is used it is very easy to render an incorrect diagnosis—due to the thickness of the frontal bone giving an apparent pathological shadow when it does not exist.

In the area of the ethmoid shadows, it is very easy to cover up a portion of the ethmoid cells by the superior margin of the petrous bone and mistake the increased density for pathology. Here also—in the ethmoid area—the presence of supra-orbital cells may be of importance to the surgeon.

In the antrum, the same condition exists; if the area shows thickened membrane, granulations or pus, and the petrous is not thrown out of the way, we cannot differentiate the pathology present from the normal shadow of the petrous. With a standardized technique we are able to give to the surgeon the position of the floor of the nose with relation to the floor of the antrum. This is of paramount importance in the draining of a pathological antrum.

In an involved sphenoid, the surgeon sometimes desires to know whether pathology is present on the right or left. With correct technique, this is very clearly defined.

For the diagnosis of pathology of the mastoid cells, the technique is of the utmost importance. The mastoid may be rayed in such a position that a few of the cells that might be involved are covered up by bone shadows, thus showing a normal mastoid with the clinical symptoms still in evidence; thus it is very important that the mastoid area be so rayed that all cells appear on the plate.

Second under consideration and equally important is the correct reading of the shadow. If we have in evidence a shadow of great density and marked contrast, it does not require a man of experience to see that a pathological condition is present; in fact, in such cases the surgeon can readily make his own diagnosis without the aid of the ray. With a case that is obscure, however, where the shadows show a slight deviation from normal and the surgeon or clinician is in doubt, the turning of the balance is in the hands of the Roentgen diagnostician. For example: a mastoid may show very vague clinical symptoms and yet the X-ray findings show a destruction of cells, warranting immediate operation.

In the ethmoid cells, it is sometimes of importance to the surgeon to know whether or not there is involvement of the anterior, middle, or posterior cells: without the aid of the X-ray, it would be impossible to differentiate.

The value of the X-ray in dental work is so well known that comment is hardly necessary at this time.

In the diagnosis of the pathology related to the sella and the pituitary body, we have in the X-ray an accurate method of measuring the size of the sella, its deviation from the normal, and the condition of the posterior or anterior processes; the calcification of the body itself is very readily diagnosed by an experienced Roentgenologist.

In conclusion, it may be said that in some cases we are prone to depend too much on the X-ray for a positive diagnosis; here the physician or surgeon is inclined to discredit all X-ray findings; unless a positive diagnosis is rendered, it should be used as one link in the chain of diagnostic evidence. There are cases where the X-ray in the hands of an experienced diagnostician will remove all doubt in the mind of the clinician or surgeon; there are other cases where it is unable to throw a ray of light upon the diagnosis; therefore to depend altogether on the ray for a decision is very unwise.

The association of the Roentgenologists with the surgeon, the internist, and the pathologist is very essential to the completion of a chain of findings in order that a satisfactory and complete diagnosis may be rendered.

DR. HOMER E. SMITH said that today the ophthalmologist is helpless without the aid of his fellow practitioner. With the exception of a few of the external diseases of the eye, the minute you pass behind the cornea, the inflammatory conditions of any of the structures are de-

pendent upon some disturbance of the body. For that reason, only by the aid of the internist the roentgenologist, and the other specialists mentioned is it possible to arrive at an accurate conclusion or diagnosis of a case. To make that picture clearer, take the subject of glaucoma: Glaucoma is not a disease in itself; to attribute its origin to purely anatomic anomalies is wholly erroneous. They may be contributory—they are occasionally so but they are never prime causes. The subject is one of pure metabolism, and only by the aid of experiments and prolonged analysis of the exceedingly intricate process which metabolism is, can we arrive at the causation of this disease. It is one of several conditions. It is either an anaphylactic phenomenon, a disturbance of the colloidal balance, a chlorid retention or some disturbance of metabolism which may lie anywhere from the ingestion of food to its final absorption by the cell. It is more likely to be a chlorid retention than any of the other things mentioned. When we consider the intricate process of metabolism, there also enters the suggestion that the endocrinologist may be the man that may be of most help; for studies have shown that the endocrine glands perform a very important part in the regulation of metabolic functions. The disturbance may lie primarily in the thyroid, the pituitary, or some of the other glands of that group.

It is utterly impossible for the oculist to conduct his work absolutely alone, even in the purely optical division of his specialty. One might think that the working out of refraction was purely an optical problem, but it is not; for you may have the refraction absolutely accurate, but the asthenopia may be dependent on a reflex disturbance, which may in turn be due to dental, nasal, or other conditions. It is not necessary to emphasize the necessity of collaboration, for it is well recognized that no man by himself can cover anything like even a portion of his own field. It has been truly said that the future of ophthalmology rests upon the fact that it not only involves every other branch of medicine but that it touches also upon every branch of scientific work.

DR. H. J. SPENCE (speaking from the laboratory standpoint) said that a point which did not seem to have been sufficiently emphasized in the discussion was the satisfaction which group study gives to the patient as well as to the physician. In the work which he had done in connection with group study in Dr. Oppenheimer's office, many a patient had expressed his satisfaction in getting the information desired under the same roof with the specialist first consulted. The point ought to be clearly recognized.

So far as the laboratory man's relations to group study are concerned, it is most important that he should be at the elbow of the man for whom the work is being done. In the first place, the laboratory man is naturally the one who should know best what particular method is most suitable for any given case in order to bring out the greatest amount of information. For example, bacteriological cultures can best be taken in certain circumstances on a particular medium. Furthermore, the laboratory man can keep the specialist or general practitioner or internist informed in regard to new and valuable methods which might not otherwise come to his attention and which would help in determining the case. Too often the laboratory is a distant aid, out of reach of the physician or specialist, a place to which the patient is sent, rather than having the laboratory man brought into contact with the case at the moment. Too often it happens that the case under consideration is best examined when the physician sees it. The patient may come with pus developing in the middle ear, and the only proper time to secure the pus is the moment the ear is opened—otherwise there is liable to be contamination—and the patient is not satisfied to have the ear left until the laboratory man can come in. It is impossible to have a laboratory man for every specialist—there are other specialties where he is of great importance. The only solution of the problem is to bring a number of men together where they can work as a group under one roof.

Another point that had not been brought out with sufficient clearness was the ease with which one falls into the habit of consulting in absentia, sending the patient away to some one, and losing the value of the personal consultation. If, on the other hand, there is a group of men working together under the same roof, the man whose aid is needed can be called in to the consultation room and the case discussed at first hand with him.

Referring to the best known group in the country: when a patient goes there, he is first examined not by a specialist who has spent years in his particular line but by a man fresh from his hospital training—who has had laboratory training for a time. The patient is thus analyzed by a person who has for the moment the best possible general collection of medical knowledge. That physician decides to what particular department of medicine the patient should next go, what particular phase of his condition should be next studied, and so he is shunted on from one to another. That young doctor remains in control of the case until he considers it finally and completely worked up, and then he presents all this information to some one to whom he is responsible; this chief then reviews it, and if further information is required the patient goes back and the young doctor sees that the information is obtained.

Another point then arises which we will come to yet, i. e., periodic conferences, upon the cases that have been seen, where the case can be talked over and analyzed, where not the individual specialist but the group as a whole decides what should be done and then the patient is handed over to the specialist or individual who is best trained in the treatment required.

Another point in regard to laboratory work came up recently. A case was being treated by a physician who had seen the patient a year previously. At that time, in his judgment, which was doubtless correct, only one or two simple examinations were necessary; but the patient was keen and wanted to learn everything possible concerning his case, and he wanted to have such and such an examination made, and went to another physician; and that physician piled upon him every examination that could possibly be made; the patient had the examination he wanted; the information needed was secured as well as much that was not needed. If he had gone to a group for study, he might have been examined for only one or two things but would have felt that in that group of men nothing would be omitted that was necessary.

Group practice in all of its interesting features ought to be applied much more than it is at the present time. We already have a type of group practice in our dispensaries that is often very ineffective. A patient is no system by means of which he can be sent through a routine and the proper information secured regarding him. Here, too the laboratories are "far distant" and samples and specimens are taken in almost any way, wanders in, sits on a bench and falls into the hands of some doctor. There often are useless to the laboratory and are worse than useless, often misleading, to the dispensary doctor. That particular form of group practice can be very much improved in this city.

DR. LEDERMAN considered group practice an ideal method which permitted a proper study of the individual patient in the shortest period of time. Its general adoption will probably occur in the near future as its advantages are quite evident. In accepting the valuable assistance of the X-ray in arriving at a definite conclusion, one must give due consideration to the clinical aspects of the case. In a number of instances in the speaker's experience the x-photo diagnosis indicated surgical intervention yet the patient recovered without operation.

DR. HOWARD LILIENTHAL said that if he were to limit himself strictly to the standpoint of general surgery he would simply say that the general surgeon who has to take his diagnosis from a group of men and then go ahead and do what they tell him is not much better than a carpenter. The general surgeon must know what he is doing. The best general surgeons who have set the standards did know what they were doing, such men as McEwen, Horsley, and others. That simply means that to be a



good conscientious general surgeon one must know something about localization and the physiology and pathology of the cerebral system. To be a mere operator would not be very satisfactory.

The title of Dr. Oppenheimer's paper, however, was "group study," not group practice: that is a different thing altogether. The practice of medicine at large cannot be group practice. We must have general practitioners who visit the patient and who find out in the vast majority of cases what the matter is and who treat the ailment. If it is necessary to send the patient to a specialist, it can be done in the good old-fashioned way, or he can make use of the nearest good diagnosing group and send the patient there for his diagnosis.

Then there is the question of diagnostic clinics, which is an exceedingly valuable idea and has surely come to stay; but such a clinic has to be conscientious. One cannot pick up offhand "any old" pathologist or "any old" neurologist, etc., and bring them together and by skillful advertising and publicity turn them into a diagnostic group without doing the professional harm. There ought to be limited and standardized diagnostic groups, so that when you go to them for diagnosis or send your patients there you know what you are doing. As to the 80 diagnostic groups in Chicago, the probability is that 70 of these 80 groups would not measure up to the standard that every conscientious physician would require if he wished to send a patient there. Dr. Mercur of Pittsburgh has studied this subject very thoroughly and has visited every important diagnostic clinic in this country that has a scheme of his own founded somewhat on that of the Mayo clinic, and is about to publish a paper on the subject. He has worked out almost mathematically just how much time ought to be given to each patient in each specialty, and what proportion of patients have to come from the general clinic to the specialists. It is a very careful study and well worthy of attention when the paper appears.

Dr. M. I. SHAMBERG (Dental Surgeon) said that the subject interested him deeply, and he was glad to express his agreement with most that had been said in the paper and in the discussion. There is no question but that there is a great need for group study in diagnosis. One of the great hardships at the present time, and one of the motives which doubtless prompted Dr. Oppenheimer's paper, is that in the past the poor man has been the most favored with group study in the Hospitals, while the large group of those of moderate means has suffered through the tendency of the average practitioner to hold on to a case from every point as long as he can keep it, often to the injury of the patient. The tendency today is toward the regulation of the shortcomings in the various specialties; and there is more disposition than there has been in the past to refer cases to other practitioners for diagnosis and for treatment.

There are, however, some features in this method of group study that could be more readily applied in the hospitals than at present, and by so grouping the men associated in a definite institution the better class of patients could there get the benefit of this study, to their great advantage.

Dr. Shamberg said that he went a step further than Dr. Lillenthal, for he believed in group practice as well as group study. The Great World War has shown in various ways what the different specialties are capable of. Some of the dental men brought back from the other side records of work that have astounded the men who have considered the dentist as merely a mechanic. They have attained the fundamental principles and have applied their training, and their standards of education are being raised so that eventually they will get their degrees practically the same as in other branches of medicine. He had seen instances where general surgeons had done work in the mouth that would not have passed muster among oral surgeons. No doubt there are many dental practitioners who have procrastinated with malignant cases in the mouth which a general surgeon would have handled much earlier. Co-operation in both diagnosis and treatment would bring about a more profound understanding of the limitations of the different specialties and the extent to

which they may be of mutual aid. In the study of focal infections which has carried every one by storm, there is so much that is true and so much that is false that the coming together over it of the various branches of the medical profession would bring about a much better understanding of the direct bearing of mouth infections. This subject has been over-worked in the wrong way and under-estimated in the right way. Too many promises are made of curing systemic maladies by the removal of infected teeth, when that procedure is only extinguishing the match that started the conflagration and not by any manner of means is it capable of restoring the parts to the normal. That remains to be done by the general practitioner of medicine and by the constitution of the patient—the combined co-operation which all get in nature under proper treatment. Too often a patient is told that if he has a certain number of teeth taken out he will get well of arthritis, etc., although it is well-known that if a certain amount of change has taken place in the tissues the effect will remain for some time, if not always, even though the cause is removed. So in all the conditions of arteritis, keratitis, and endarteritis, the gastric ulcer group, appendicitis, etc., there is often a definite close relationship. No patient has ever contracted a pneumonia or a typhoid fever, or other malady that threatens life, whose chances of recovery are not materially lessened by the presence of a focus of infection; in other words, it is a factor which often means either recovery or death, and oftentimes it means the acquiring or not acquiring a disease; two men may be equally exposed, the one acquires the disease, the other does not. It is the susceptibility to an infection that is lessened or increased by the absence or presence of some bacteria which he is constantly carrying with him. It is the same in the surgery of the head. Many cases of bony ankylosis of the jaw have gone on for years, the patients accepting a verdict that nothing could be done for them; yet in the hands of a competent oral surgeon many of these cases can be operated upon and relieved and given good use of the mouth. The same could be said of much of the harelip and cleft palate work, though here, Dr. Shamberg said, he took issue with Dr. Oppenheimer that the rhinologist is especially fitted for such work, since the best work in this line has been done by prominent oral surgeons, such as Brophy and Brown. The same was true of other conditions of the mouth which come to the oral surgeons. While it is necessary to restrain the general dentist who attempts to do work for which he is not fitted, it should be recognized that the properly qualified oral surgeon is taking the same standing as the otologists, laryngologists, and other branches of medicine. Ten or twenty years ago the general surgeon would hold up his hands in horror at the idea of an otologist doing brain work. All of this work is best done by those who have made a life study of it; and with the great recognition of the possibilities in the various specialties, even the general surgeon in close communion with the other specialists will derive much benefit as well as the patient.

DR. ROYAL S. COPELAND (Commissioner of Health) expressed his pleasure in meeting with a lot of real doctors, instead of medical politicians and members of the Dairymen's League and others of that type, and his gratification in listening to a discussion by scientific practitioners.

He has long felt that the subtle thing known as institutionalism is a matter which ought to receive the serious attention of the medical profession. It would be interesting to know how many of those present had ever taken occasion to visit institutions where chronic cases of any sort are sent, such as those on Randall's Island, for instance, where are the feeble-minded and the insane, etc. He himself had never been to Randall's Island but once, and intended never to go again except with a body of men who would help the conditions there, which, however, are mainly those of the institutionalism which grows up in connection with any home. There are some patients on Randall's Island who have been there for thirty-five years. Probably these particular cases which have been there so long had an unfavorable prognosis and were hopeless from the beginning; but supposing there was a staff of men representing every one

of the cases in the hospital once in so often, and not stop because in any particular group nothing could then be done. Some years from now medicine may have made progress enough to survey these patients again. Much can be done in these days that formerly was not possible. That is simply an example of what is doubtless true in every institution where patients are confined for all time. The same thing has been seen in blind asylums, where patients have been admitted and forgotten for perhaps twenty years, and then some enterprising oculist comes along and says that this or that man can have his sight restored by an operation.

Institutionalism is a thing to be hated, and the men of the medical profession ought to be in the forefront of making it impossible for some poor devil to be put away and forgotten by Society. We now live in a new age and can meet together and discuss a question like group medicine. It is a revelation to compare such a discussion with the discussion of conditions of thirty years ago.

Dr. Copeland said that his memory of medicine went back a long time, to the country, where he was born and lived in a little country town where the Doctors never spoke to each other. Group medicine! He recalled two old saints in that town who have both been in heaven now for a quarter of a century. Dr. T. had a patient who recovered and the pious man gave notice in the newspaper that he had done so "Thanks to God and Dr. T." Dr. E. went around the town saying: "Indeed! Better say Thanks to God, in spite of Dr. T." In that day group medicine was impossible; it is possible now, yet it is neglected in our hospitals. Every one knows how it may happen that in a certain service there may be a patient who does not attract the interest of the attending and stays there month after month, no one really taking hold of the case and giving him relief. In one instance a suggestion was made by him as chief, that a committee of the staff be appointed to make a survey of the hospital every six weeks of all the patients in the hospital to see what was happening to them, but a tremendous row was the only result. Every one said that he would not have any interference with his business, and the matter was dropped. There ought, however, to be such a survey in every hospital at regular intervals in order to check up the work being done and learn whether the patients are receiving all the benefit possible.

Dr. Copeland said he was much interested in what Dr. Lillenthal had said about group practice. A lot of this work is to some extent under the influence of the Department of Public Health. Buildings are put up and it becomes an institution, and then the group gets mad with the Commissioner because there is a little regulation of it. That is always disagreeable.

As Dr. Oppenheimer had so ably brought out in his paper, there is no doubt that by frequent consultations of men intimately associated society will be benefited, and after a while much more will be demanded of the medical profession than today.

Dr. Copeland said he was very much in sympathy with the action taken by the American College of Surgeons toward standardizing the hospitals. There are many problems to be solved in the Hospitals in our city. There are 36,000 beds here, only 6,000 of which are owned by the city, 30,000 in the private hospitals, and they operated last year at a loss of \$200,000. Some way must be found to not only give them an income with which to pay their bills but also to enable them to improve their facilities and make it possible for them to render to New York City the service that ought to be rendered! That is not saying that many of them are not ably conducted, for they are. They are the finest in the world in many respects, but they ought to be made finer still, and the Academy of Medicine ought to lead in this matter and see that the hospital conditions here are improved.

DR. HAROLD HAYS said that he was agreeably surprised that every one had agreed that group study and practice was the ideal thing, and he expressed the opinion that if the men could only get the proper group together they would be delighted with the results. In 1915 he had had

this idea in mind and had invited a group of different specialists to meet in his office, and seventeen men, including Dr. Goldwater, Commissioner of Health, met to discover whether they could organize some sort of an association under one roof where they could help each other out, but not one of those men could agree with any other as to what should be done. The best endorsement he could give to the idea set forth by Dr. Oppenheimer was to say that he had a small organization of his own along these lines which had worked out ideally and where all engaged had profited by the association.

DR. OPPENHEIMER, in closing the discussion, said that he did not know whether he had been striving toward too much idealism or whether he had grown very ignorant in the last few years, but he found that he derived a great deal of assistance from other men and that he has to seek a great deal of advice from other men that he had not formerly required. He therefore naturally felt that there was great necessity for group study.

In the final analysis group study means group practice, whether that be carried on under one roof as he has endeavored with head work, or whether the patients be referred to other men situated at a distance from one's office, the same thought is being carried out, in order to establish the diagnosis and formulate the opinions which are essential thereto. Take for example, a patient consults us suffering with vertigo. Labyrinth tests are made to determine what information can be gained; it is known that an accessory sinus condition may cause it; that a syphilitic condition may cause vertigo, and a Wassermann test may have to be made, or spinal fluid examination made. Nephritis may cause it, and a urine examination is made. Arterio-sclerosis may cause it, and the patient must be examined from the general standpoint. An eye examination may be necessary. All these may be necessary in order to be able to express a definite opinion as to the cause of the vertigo.

Dr. Oppenheimer said that he did not agree with Dr. Lilienthal that the profession is driving toward commercialism.

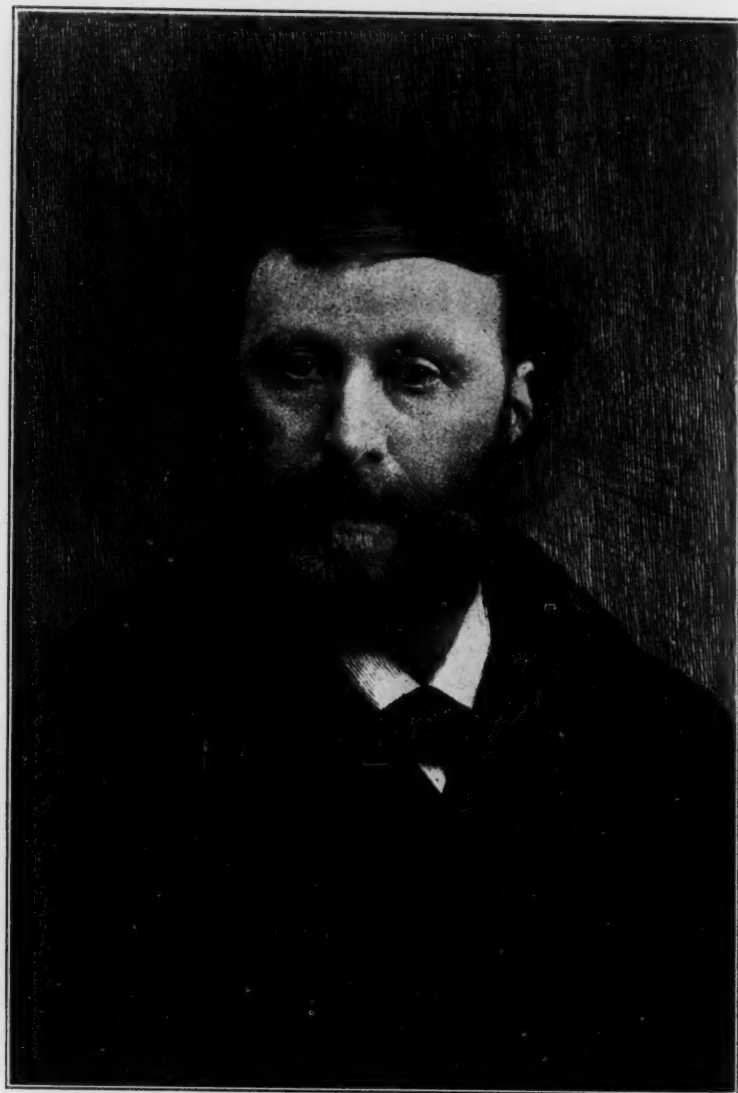
(Cited the Mayo Clinic and the University of Minnesota.)

There are two classes of people who really get attention, the very rich and the very poor. At Mount Sinai Hospital, for instance, as well as in other institutions, the demands made upon the men in the various specialties to examine patients occupy a great deal of time, but the men in their private practice do not call upon the specialists to the same degree. It is the poor devil in the hospital that is getting the advantage of skilled specialistic opinion in the various branches, and the rich men; while the individual who has to figure out where every cent has to go, does not have the same advantages.

Dr. Oppenheimer said that he had not intended to create the impression intimated by some of the speakers that one should depend upon the laboratory tests or the X-ray examination, for the establishment of the diagnosis, but had simply tried to present the value of such tests in aiding one to come to a conclusion; nor did he attempt to indicate that the general surgeon should be dependent upon the group for their education, but even Dr. McEwen's cranial surgery might have been more successful had he had the association of an otologist to establish many of his diagnoses. The history of cranial surgery in this country has the example of Cushing to show how necessary it is to have the help of the otologist to establish many differential diagnoses between an internal ear lesion or a lesion of the intra-cranial contents. That has been brought out repeatedly by Fisher and Jones of Philadelphia. What is needed is the closer association of the various specialists. It is not easy to get a group together to carry out these ideas in regard to head surgery, but so far as he himself has tried it, it has been very helpful and he hopes if he can practice medicine with the co-operation of the men associated with him along the indicated lines, it is his belief that he, as well as his patients, will be greatly benefited thereby.







Professor Dr. A. Solzgen

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### IN MEMORIAM.

Hofrat Professor Dr. Adam Politzer, the father of modern otology and the Nestor of the otological world, is dead. He died in Vienna, August 13, 1920, a seer of eight-five years of age, retaining his splendid faculties to the end. Politzer, a man respected and venerated by the entire medical profession, has immortalized himself by his many and versatile achievements in the otological world in which he has stood for more than a half century as a tower of strength and an inimitable working force.

As a pioneer in otology, he blazed the way through untrodden fields; as a keen observer and an indefatigable worker, he contributed a herculean share of the splendid literature of which otological science is now justly proud; as a clinician second to none, he developed the opportunities of the great Vienna clinics and made of the otological section a Mecca for the medical profession of the world. His independence of thought and creative mind made him the greatest authority in otology; his scholarly contributions to scientific literature are imperishable monuments; his genial manner, democratic and courteous attitude won for him the esteem of the thousands of otologists from all parts of the world who visited his renowned Vienna clinic. He was justly named "Master." It was an inspiring sight at International Otological Congresses to witness the respect and veneration with which he was always received. He was figuratively borne on the shoulders not only of his students and proteges but also of his peers and confreres.

It was the unusual privilege of the writer, while doing post-graduate work in Vienna during the summer of 1893, to serve as his private assistant and thus to gain a more intimate insight into the character of this grand old man. He was even then an old man in years, but possessed of an untiring working energy beyond description. His spirit for conscientious work inspired all who came in contact with him; his profound knowledge of every detail with which otological science concerns itself was the secret of his strength. He was a keen observer of men and things. He was gentle in manner, kind of heart, courteous in act. Coupled with his creative genius was his practical, logical and lucid mind and a

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wonderful memory. He had the delicate hand and supple fingers of an artist as evinced by the wonderful collection of otological preparations which he personally made and the bulk of which are accurately described and illustrated in that fascinating volume, "Die Anatomische und Histologische Zergliederung des Menschlichen Gehörorgans." He was an exquisite draftsman and his facile pencil illustrated many of his important anatomical descriptions; he was a beautiful modeller as his series of models of the membrana tympani in plaster have proven; he was a keen lover of the arts as his extensive and valuable collection of paintings and etchings indicated. This love of the arts of the brush, pen and pencil was his hobby. His waiting room was a veritable gallery of choice master-paintings and he never tired of recounting the many incidents and stories associated with their acquisition.

We have seen him on numerous occasions after an arduous day's work in the clinic, in the lecture-room, and in his private practice, come into the little laboratory in his residence on Gonzaga Gasse about eight o'clock of an evening and sit with his microscope, his specimens and his drawing pencils into the wee, small hours of the morning. He was then a man of nearly sixty, but still fired with the spirit of youth and inspired with the dignity of work. Unlike many scientific workers whose lives have been diligently but impotently spent, his work was of the definitely productive kind. He therefore leaves a legacy to otology in clinical accomplishments, in original ideas practically applied, in a masterful collection of histological, osteological and pathological preparations of every conceivable form, in originally-drawn illustrations with pen and pencil, and above all, in his literary productions—a legacy of quality and quantity in scientific work of every phase of his specialty seldom known in the medical world.

Adam Politzer was born, 1835, in Alberti, Hungary, received his degree as Doctor of Medicine in the University of Vienna in 1859. His first special work was done in the Physiological Institute of the Josefs Academie under the direction of Karl Ludwig. His contributions, "The Innervation of the Intrinsic Muscles of the Ear" and "The Influence of Variations in Air Pressure in the Tympanic Cavity on the Pressure Relations in the Labyrinth," were published in the Akademie der Wissenschaften in Vienna in 1861. In Würtzbuerg Politzer studied the microscopic technique of the

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labyrinth under Kölliker; working under Heinrich Muller, he published his experimental-physiologic monograph, "The Relations of the Trigemini to the Eustachian Tube." There he met von Tröltsch; then to Heidelberg to see the work of Helmholtz. In Paris he worked with the physiologist, Claude Bernard, and in the Acoustic Institute of Rudolph Koenig on experimental studies in the excursions of the ossicles. Here also he visited the "Institution Nationale des Sourds et Muets" of Meniere. In London he studied the wonderful collection of pathologic-anatomic specimens of Toynbee and through the stimulus of this British master laid the foundation of his own work of similar character.

In 1861, he began his labors in Vienna as dozent in otology, the first teacher in this specialty in the Vienna University. His clinical material was drawn from the clinics of Oppolzer and Kolisko and from the pathological department of Rokitsansky. In 1870 he received the title Professor Extraordinarius, and in 1873 he was made Chief of the newly created Ear Clinic of the University of Vienna. In 1896 he was made Professor Ordinarius; in 1902 he was named Hofrat, and in October, 1907, according to the regulations of the University, Emeritus.

The teaching and scientific activities of this master cover a cycle of half a century. There is no department of otology to which he has not contributed fundamental and potent work. His favorite field was the anatomy and pathological anatomy of the ear. In 1889, he published his remarkable book, "Die Anatomische und Histologische Zergliederung des Menschlichen Gehörorgans im Gesunden und Kranken Zustande." A series of sixty osteological specimens made by Politzer were presented to the Anatomical Museum in Philadelphia. His ten "Wandtafeln zur Anatomie des Gehörorgans," published in 1878, are found in every otologic clinic.

In many of the pathological investigations of the ear, Politzer has established the first clinical entity, as in otosclerosis, panotitis and leukemia. In 1863, he described his method of inflating the middle-ear known today as Politzerization. The treatment of attic diseases and endo-tympanic operations in adhesive processes following suspended middle-ear suppuration was inaugurated by him.

His "Beleuchtungsbilder des Trommelfells," published in 1865, and his "Atlas der Krankheiten des Trommelfells," published in

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1896, are imperishable monographs. He was the first to suggest otoscopic diagnosis of sero-mucous exudate in the tympanic cavity. He elaborated functional tuning-fork tests; one original tuning-fork test bears his name.

To the journal-literature of otology he contributed over one hundred monographs and articles. His greatest literary creation, first edition in 1878 and fifth edition in 1908, "Lehrbuch der Ohrenheilkunde," translated into English, French and Spanish is, without exception, the greatest text-book in otology.

It is an interesting observation of his popularity and renown as a clinical teacher that over seven thousand foreign matriculants have registered in his clinics during the forty-six years of his teaching service there.

The first volume of his last great literary production, "Geschichte der Ohrenheilkunde," was published in 1907, and the second volume in 1913. Here again we find the versatile brain of the master, for it is replete with historic research and a profound knowledge of the Latin and Italian classics and of the arts.

On October 9, 1909, the Fiftieth Anniversary of his doctorate, a fitting climax to the labors of this grand old man was reached in a Jubileum in Vienna, participated in by his faculty associates, representatives of Universities, colleagues, assistants, proteges and students from all parts of the world.

What a glorious finale, what a rich legacy, what an uplifting stimulus to the science of otology the life and work of one man can be!

*M. A. Golstein*

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